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STUDY OF FIFTH ARMY HOSPITAL BATTLE CASUALTY DEATHS

A PRELIMINARY REPORT

IN THREE VOLUMES

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SNYDER and CULBERTSON

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STUDY OF FIFTH ARMY HOSPITAL BATTLE CASUALTY DEATHS

An Analysis of Case Reports from Field and Evacuation Hospitals
on 1450 Fatally Wounded American Soldiers

* * *

A PRELIMINARY REPORT

IN THREE VOLUMES

by

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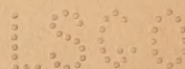
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Gardone Riviera, Italy
September 1945



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FOREWORD

This report is submitted as a comprehensive survey and partial analysis of available information on battle casualty deaths reported by Fifth Army hospitals. Time has not permitted further consolidation and interpretation of the findings, or exposition on the lessons which may be drawn from this study.

A tremendous amount of work has been involved in the preparation of this material. Captain James W. Culbertson must be credited with the major share. His patient, exacting, critical examination of the records and careful appraisal of the accumulating statistical information have done much to insure the accuracy of this report. He devoted his entire time to this project from April until September 1945 with the exception of one week when he returned to the 8th Evacuation Hospital to do surgery at the time of the Po Valley offensive.

Brigadier General Joseph I. Martin, Army Surgeon at the time the study was started, encouraged and helped make possible this report. Colonel Charles O. Bruce, the Fifth Army Surgeon during the latter months of the study, has given needed advice and has provided all necessary clerical assistance.

Major Richard A. Morrissey, Statistician in the Surgeon's Office, has also been a source of great encouragement. He has lent valuable advice and has made specific contributions to this report. His continued interest has been most stimulating.

The assistance of the clerical staff has been most excellent. Sergeant Merl Phinney has worked with the authors the past 4 months. It was he who key-punched all the machine records cards in the final preparation of the report. His assistance in preparing tables and in many other respects has been invaluable. Sergeant Linton Fincher worked for one month accumulating data on time lags and plasma and blood transfusion therapy and was most helpful. In the final preparation of the report all of the clerical staff in the Surgeon's Office and men from the 8th and 38th Evacuation Hospitals worked overtime, in a spirit of cheerful cooperation, to complete the report before our departure from Italy.

The staff of the 2nd Medical Laboratory and the 15th General Medical Laboratory have been most helpful in providing reports on the microscopic examination of tissues. The staffs of the 9th Machine Records Unit (Mobile) and the 60th Machine Records Unit (Fixed) have rendered great assistance respectively in advice regarding preparation of the code for the machine records cards and in providing assistance and facilities for the machine computation of statistical data. Finally, the Adjutant General's Staff has been most cooperative in giving their time and skill in reproducing this report at a time when it was inconvenient.

To all above as well as the many individuals who have not been mentioned the authors express sincere appreciation for their unselfish contributions.

Howard E. Snyder

HOWARD E. SNYDER, Colonel, MC

T A B L E

O F

C O N T E N T S

TABLE OF CONTENTS

VOLUME ONE

Table	Page
FOREWORD	11
INTRODUCTION	1
SECTION I	
REGION, TYPE, AND DISTRIBUTION OF WOUNDS, AND CERTAIN GENERAL CONSIDERATIONS	5
Preliminary Remarks	6
I BATTLE CASUALTY DEATHS (1450 CASES), DISTRIBUTION BY REGION OF PRINCIPAL WOUND	8
II DEATHS AS RELATED TO HOSPITAL ADMISSION, ANESTHESIA, AND SURGERY	9
III HOSPITAL BATTLE CASUALTY ADMISSIONS DYING BEFORE ANESTHESIA AS COMPARED WITH THOSE DYING DURING ANESTHESIA OR SURGERY AND WITH THE TOTAL BATTLE CASUALTY DEATHS IN ARMY HOSPITALS	10

TABLE OF CONTENTS

Table	Page
IV DEMONSTRATION OF EFFECT OF INCREASED EFFICIENCY OF EVACUATION FROM FORWARD AREAS ON HOSPITAL MOR- TALITY (AN INCREASE) AND THE REMAINING FAVORABLE TREND AFTER EXCLUSION OF THOSE CASES DYING BEFORE ANESTHESIA	11
V BATTLE CASUALTY DEATHS LISTED AS TO PRINCIPAL WOUND	12
VI CAUSATIVE AGENTS AS RELATED TO PRINCIPAL WOUND (1)	13
VII CAUSATIVE AGENTS (2) AND CHARACTER OF WOUNDS	14
VIII HOSPITAL BATTLE CASUALTY DEATHS LISTED AS TO PRINCIPAL WOUND, WITH PERCENTAGE OF HOSPITAL BATTLE CASUALTY ADMISSIONS	15
IX BATTLE CASUALTY DEATHS LISTED AS TO PRINCIPAL WOUND AND RELATED TO HOSPITAL ADMISSION, ANESTHESIA, AND SURGERY	16
X NUMBER OF CASES IN EACH PRINCIPAL WOUND GROUP BY PERIODS	17
XI PERCENTAGE OF CASES IN EACH PRINCIPAL WOUND GROUP BY PERIODS	18
Remarks	19
XII DISTRIBUTION ACCORDING TO PRINCIPAL WOUND OF CASES WITHOUT ASSOCIATED WOUNDS IN OTHER REGIONS, COM- PARED WITH ALL CASES IN THE SERIES	20
XIII PRINCIPAL AND ASSOCIATED WOUNDS: NUMBER OF CASES EXHIBITING EACH TYPE	21
XIV REGIONAL DISTRIBUTION OF PRINCIPAL AND ASSOCIATED WOUNDS, SHOWING THE NUMBER OF CASES EXHIBITING EACH	22

TABLE OF CONTENTS

Table		Page
	INCIDENCE ASSOCIATED WOUNDS AS RELATED TO PRINCIPAL WOUND;	25
XV	CASES WITH ASSOCIATED HEAD AND INTRAVERTEBRAL WOUNDS	25 ✓
XVI	CASES WITH ASSOCIATED MAXILLOFACIAL WOUNDS	26
XVII	CASES WITH ASSOCIATED CERVICAL WOUNDS	27
XVIII	CASES WITH ASSOCIATED THORACIC WOUNDS	28
XIX	CASES WITH ASSOCIATED ABDOMINAL WOUNDS	29
XX	CASES WITH ASSOCIATED UPPER EXTREMITY WOUNDS WITHOUT INVOLVEMENT OF BONE	30
XXI	CASES WITH ASSOCIATED UPPER EXTREMITY WOUNDS WITH BONE INVOLVED	31
XXII	CASES WITH ASSOCIATED LOWER EXTREMITY WOUNDS WITHOUT INVOLVEMENT OF BONE	32
XXIII	CASES WITH ASSOCIATED LOWER EXTREMITY WOUNDS WITH BONE INVOLVED	33
XXIV	INCIDENCE OF ARTERIES INJURED (excluding traumatic amputations)	34
XXV	INCIDENCE OF NERVES INJURED (excluding traumatic amputations)	36

TABLE OF CONTENTS

Table	Page
SECTION II	
SURGERY, ANESTHESIA, REPLACEMENT THERAPY, CHEMOTHERAPY, OXYGEN THERAPY, AND MISCELLANEOUS DATA AND OBSERVATIONS	38
Preliminary Remarks	39
XXVI PRIMARY OPERATIONS AS RELATED TO PRINCIPAL WOUND	41
XXVII DEBRIDEMENT OF OTHER WOUNDS ASSOCIATED WITH PRIMARY OPERATION FOR THE PRINCIPAL WOUND	43
XXVIII SUBSIDIARY OPERATIONS AT THE TIME OF THE PRIMARY OPERATION AS RELATED TO PRINCIPAL WOUND	44
XXIX OPERATING TIME FOR PRIMARY SURGERY AS RELATED TO PRINCIPAL WOUND	46
XXX SECONDARY (LATER) OPERATIONS AS RELATED TO PRINCIPAL WOUND	48
XXXI ANESTHESIA FOR PRIMARY SURGERY AS RELATED TO PRINCIPAL WOUND	52
XXXII ANESTHESIA FOR SECONDARY SURGERY AS RELATED TO PRINCIPAL WOUND	54
XXXIII OXYGEN THERAPY AS RELATED TO PRINCIPAL WOUND	56
XXXIV CHEMOTHERAPY AS RELATED TO PRINCIPAL WOUND	57
XXXV INTRAVENOUS PLASMA THERAPY BEFORE ADMISSION TO HOSPITAL AS RELATED TO PRINCIPAL WOUND	58
XXXVI INTRAVENOUS PLASMA THERAPY AFTER ADMISSION TO HOSPITAL BEFORE SURGERY AS RELATED TO PRINCIPAL WOUND	60

TABLE OF CONTENTS

Table	Page
XXXVII INTRAVENOUS PLASMA THERAPY DURING SURGERY AS RELATED TO PRINCIPAL WOUND	62
XXXVIII INTRAVENOUS PLASMA THERAPY AFTER SURGERY AS RE- LATED TO PRINCIPAL WOUND	64
XXXIX BLOOD TRANSFUSION THERAPY BEFORE SURGERY AS RE- LATED TO PRINCIPAL WOUND	66
XL BLOOD TRANSFUSION THERAPY DURING SURGERY AS RELATED TO PRINCIPAL WOUND	68
XLI BLOOD TRANSFUSION THERAPY AFTER SURGERY AS RELATED TO PRINCIPAL WOUND	70
XLII SYSTOLIC BLOOD PRESSURE ON ADMISSION TO HOSPITAL AS RELATED TO PRINCIPAL WOUND	72
XLIII LOWEST RECORDED SYSTOLIC BLOOD PRESSURE FOR CASES IN SHOCK AS RELATED TO PRINCIPAL WOUND	74
XLIV NATURE OF EVIDENCE FOR SHOCK IN CASES WITHOUT RE- CORDED HYPOTENSION AS RELATED TO PRINCIPAL WOUND	75
XLV URINARY OUTPUT AS RELATED TO PRINCIPAL WOUND	76
XLVI MISCELLANEOUS OBSERVATIONS AS RELATED TO PRINCIPAL WOUND	77
XLVII DATA RELATIVE TO DISTRIBUTION OF DEATHS IN FIELD AND EVACUATION HOSPITALS	78
XLVIII POST MORTEM EXAMINATIONS AS RELATED TO PRINCIPAL WOUND	79

TABLE OF CONTENTS

Table	Page
SECTION III	
CAUSES OF DEATH	
Part 1	
General Observations	80
Preliminary Remarks	81
XLIX IMMEDIATE CAUSE OF DEATH	85
L THE LEADING CAUSES OF DEATH IN 1450 BATTLE CASUALTY DEATHS, SHOWING THE NUMBER OF CASES BY PERIOD	88 ✓
LI THE LEADING CAUSES OF DEATH IN 1450 BATTLE CASUALTY DEATHS, SHOWING PERCENTAGE DISTRIBUTION BY PERIOD	89
LII THE LEADING CAUSES OF DEATH IN 1450 BATTLE CASUALTY DEATHS, SHOWING THE PERCENTAGE OF THE TOTAL BATTLE CASUALTY ADMISSIONS BY PERIOD	90
LIII REGION OF IMMEDIATE CAUSE OF DEATH: NUMBER OF CASES BY PERIOD	91
LIV REGION OF IMMEDIATE CAUSE OF DEATH: PERCENTAGE DISTRIBUTION BY PERIOD	92
LV REGION OF PRINCIPAL WOUND COMPARED WITH REGION OF IMMEDIATE CAUSE OF DEATH, GENERAL, WITH PERCENTAGES OF CASES STUDIED	93
LVI REGION OF IMMEDIATE CAUSE OF DEATH AS RELATED TO REGION OF PRINCIPAL WOUND, DETAILED	94
LVII REGION OF PRIMARY TRAUMA LEADING TO DEATH: NUMBER OF CASES BY PERIOD	96

TABLE OF CONTENTS

Table	Page
LVIII REGION OF PRIMARY TRAUMA LEADING TO DEATH; PERCENTAGE DISTRIBUTION BY PERIOD	97
LIX PRIMARY TRAUMA LEADING TO DEATH AS RELATED TO PRINCIPAL WOUND, GENERAL	98
LX REGION OF PRIMARY TRAUMA LEADING TO DEATH AS RELATED TO REGION OF PRINCIPAL WOUND, DETAILED	99
Remarks	101
LXI TOTAL REPORTED INCIDENCE OF SHOCK IN 1450 BATTLE CASUALTY DEATHS	102
LXII TOTAL REPORTED INCIDENCE OF INTRACRANIAL CONDITIONS	104
LXIII TOTAL REPORTED INCIDENCE OF MAXILLOFACIAL CONDITIONS	105 ✓
LXIV TOTAL REPORTED INCIDENCE OF CERVICAL CONDITIONS	106
LXV TOTAL REPORTED INCIDENCE OF INTRAVERTEBRAL CONDITIONS	107
LXVI TOTAL REPORTED INCIDENCE OF EXTREMITY CONDITIONS	108
LXVII TOTAL REPORTED INCIDENCE OF THORACIC CONDITIONS	109
LXVIII TOTAL REPORTED INCIDENCE OF ABDOMINAL CONDITIONS	113
LXIX TOTAL REPORTED INCIDENCE OF CLOSTRIDIAL MYOSITIS OR CEREBRITIS	117
LXX TOTAL REPORTED INCIDENCE OF EMBOLISM, INFARCTION, AND THROMBOSIS	118
LXXI TOTAL REPORTED INCIDENCE OF MISCELLANEOUS DATA	119

TABLE OF CONTENTS

VOLUME TWO

Table

Page

SECTION III

CAUSES OF DEATH

Part 2

Detailed Observations	120
Preliminary Remarks	120
Causes of Death in Those Cases in Which the Principal Wound Was Intracranial:	121
LXXII IMMEDIATE CAUSE OF DEATH	121
LXXIII THE ETIOLOGY OF SHOCK IN ITS INCIDENCE AS A CON- TRIBUTORY OR ASSOCIATED CONDITION	122
LXXIV DATA ON SHOCK IN ITS INCIDENCE AS A CONTRIBUTORY OR ASSOCIATED CONDITION	123
LXXV INTRACRANIAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	124
LXXVI MAXILLOFACIAL AND CERVICAL CONTRIBUTORY OR ASSOCIAT- ED CONDITIONS	125
LXXVII THORACIC CONTRIBUTORY OR ASSOCIATED CONDITIONS	126
LXXVIII ABDOMINAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	129
LXXIX INTRAVERTEBRAL AND EXTREMITY CONTRIBUTORY OR ASSOCIATED CONDITIONS	131

TABLE OF CONTENTS

Table	Page
LXXX CLOSTRIDIAL MYOSITIS AS A CONTRIBUTORY OR ASSOCIATED CONDITION	132
LXXXI EMBOLISM, INFARCTION, AND THROMBOSIS AS CONTRIBUTORY OR ASSOCIATED CONDITIONS	133
LXXXII MISCELLANEOUS DATA	134
Causes of Death in Those Cases in Which the Principal Wound Was Intravertebral:	135
LXXXIII IMMEDIATE CAUSE OF DEATH	136
LXXXIV THE ETIOLOGY OF SHOCK IN ITS INCIDENCE AS A CON- TRIBUTORY OR ASSOCIATED CONDITION	137
LXXXV DATA ON SHOCK IN ITS INCIDENCE AS A CONTRIBUTORY OR ASSOCIATED CONDITION	138
LXXXVI INTRACRANIAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	139
LXXXVII MAXILLOFACIAL AND CERVICAL CONTRIBUTORY OR ASSOCIAT- ED CONDITIONS	140
Note: There is an inadvertent hiatus between pages 140 and 150.	
LXXXVIII INTRAVERTEBRAL AND EXTREMITY CONTRIBUTORY OR ASSOCIAT- ED CONDITIONS	150
LXXXIX THORACIC CONTRIBUTORY OR ASSOCIATED CONDITIONS	151
X ABDOMINAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	153
XCI CLOSTRIDIAL MYOSITIS AS A CONTRIBUTORY OR ASSOCIATED CONDITION	154

TABLE OF CONTENTS

Table	Page
XCII EMBOLISM, INFARCTION, AND THROMBOSIS AS CONTRIBUTORY OR ASSOCIATED CONDITIONS	155
XCIII MISCELLANEOUS DATA	156
Causes of Death in Those Cases in Which the Principal Wound Was Maxillofacial:	157
XCIV IMMEDIATE CAUSE OF DEATH	158
XCV THE ETIOLOGY OF SHOCK IN ITS INCIDENCE AS A CONTRIBUTORY OR ASSOCIATED CONDITION	159
XCVI DATA ON SHOCK IN ITS INCIDENCE AS A CONTRIBUTORY OR ASSOCIATED CONDITION	160
XCVII INTRACRANIAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	161
XCVIII MAXILLOFACIAL AND CERVICAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	162
XCIX INTRAVERTEBRAL AND EXTREMITY CONTRIBUTORY OR ASSOCIATED CONDITIONS	163
C THORACIC CONTRIBUTORY OR ASSOCIATED CONDITIONS	164
CI ABDOMINAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	165
CII CLOSTRIDIAL MYOSITIS AS A CONTRIBUTORY OR ASSOCIATED CONDITION	166
CIII EMBOLISM, INFARCTION, AND THROMBOSIS AS CONTRIBUTORY OR ASSOCIATED CONDITIONS	167
CIV MISCELLANEOUS DATA	168

TABLE OF CONTENTS

Table	Page
Causes of Death in Those Cases in Which the Principal Wound Was Cervical:	169
CV IMMEDIATE CAUSE OF DEATH	170
CVI THE ETIOLOGY OF SHOCK IN ITS INCIDENCE AS A CONTRIBUTORY OR ASSOCIATED CONDITION	171
CVII DATA ON SHOCK IN ITS INCIDENCE AS A CONTRIBUTORY OR ASSOCIATED CONDITION	172
CVIII INTRACRANIAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	173
CIX MAXILLOFACIAL AND CERVICAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	174
CX INTRAVERTEBRAL AND EXTREMITY CONTRIBUTORY OR ASSOCIATED CONDITIONS	175
CXI THORACIC CONTRIBUTORY OR ASSOCIATED CONDITIONS	176
CXII ABDOMINAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	178
CXIII CLOSTRIDIAL MYOSITIS AS A CONTRIBUTORY OR ASSOCIATED CONDITION	179
CXIV EMBOLISM, INFARCTION, AND THROMBOSIS AS CONTRIBUTORY OR ASSOCIATED CONDITIONS	180
CXV MISCELLANEOUS DATA	181
Causes of Death in Those Cases in Which the Principal Wound Was Intrathoracic:	182
CXVI IMMEDIATE CAUSE OF DEATH	182
CXVII THE ETIOLOGY OF SHOCK IN ITS INCIDENCE AS A CONTRIBUTORY OR ASSOCIATED CONDITION	183

TABLE OF CONTENTS

Table	Page
CXVIII DATA ON SHOCK IN ITS INCIDENCE AS A CONTRIBUTORY OR ASSOCIATED CONDITION	184
CXIX INTRACRANIAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	185
CXX MAXILLOFACIAL AND CERVICAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	186
CXXI INTRAVERTEBRAL AND EXTREMITY CONTRIBUTORY OR ASSOCIATED CONDITIONS	187
CXXII THORACIC CONTRIBUTORY OR ASSOCIATED CONDITIONS	188
CXXIII ABDOMINAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	191
CXXIV CLOSTRIDIAL MYOSITIS AS A CONTRIBUTORY OR ASSOCIATED CONDITION	193
CXXV EMBOLISM, INFARCTION, AND THROMBOSIS AS CONTRIBUTORY OR ASSOCIATED CONDITIONS	194
CXXVI MISCELLANEOUS DATA	195
Causes of Death in Those Cases in Which the Principal Wound Was Thoraco-abdominal:	196
CXXVII IMMEDIATE CAUSE OF DEATH	196
CXXVIII THE ETIOLOGY OF SHOCK IN ITS INCIDENCE AS A CONTRIBUTORY OR ASSOCIATED CONDITION	198
CXXIX DATA ON SHOCK IN ITS INCIDENCE AS A CONTRIBUTORY OR ASSOCIATED CONDITION	199
CXXX INTRACRANIAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	200
CXXXI MAXILLOFACIAL AND CERVICAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	201

TABLE OF CONTENTS

Table	Page
CXXXII INTRAVERTEBRAL AND EXTREMITY CONTRIBUTORY OR ASSOCIATED CONDITIONS	202
CXXXIII THORACIC CONTRIBUTORY OR ASSOCIATED CONDITIONS	203
CXXXIV ABDOMINAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	206
CXXXV CLOSTRIDIAL MYOSITIS AS A CONTRIBUTORY OR ASSOCIATED CONDITION	209
CXXXVI EMBOLISM, INFARCTION, AND THROMBOSIS AS CONTRIBUTORY OR ASSOCIATED CONDITIONS	210
CXXXVII MISCELLANEOUS DATA	211
Causes of Death in Those Cases in Which the Principal Wound Was Combined Intra-abdominal and Intra-thoracic:	212
CXXXVIII IMMEDIATE CAUSE OF DEATH	213
CXXXIX THE ETIOLOGY OF SHOCK IN ITS INCIDENCE AS A CONTRIBUTORY OR ASSOCIATED CONDITION	214
CXL DATA ON SHOCK IN ITS INCIDENCE AS A CONTRIBUTORY OR ASSOCIATED CONDITION	215
CXLI INTRACRANIAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	216
CXLII MAXILLOFACIAL AND CERVICAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	217
CXLIII INTRAVERTEBRAL AND EXTREMITY CONTRIBUTORY OR ASSOCIATED CONDITIONS	218
CXLIV THORACIC CONTRIBUTORY OR ASSOCIATED CONDITIONS	219
CXLV ABDOMINAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	222

TABLE OF CONTENTS

Table	Page
CXLVI CLOSTRIDIAL MYOSITIS AS A CONTRIBUTORY OR ASSOCIATED CONDITION	225
CXLVII EMBOLISM, INFARCTION, AND THROMBOSIS AS CONTRIBUTORY OR ASSOCIATED CONDITIONS	226
CXLVIII MISCELLANEOUS DATA	227
Causes of Death in Those Cases in Which the Princinal Wound Was Intra-abdominal:	228
CXLIX IMMEDIATE CAUSE OF DEATH	229
CL THE ETIOLOGY OF SHOCK IN ITS INCIDENCE AS A CONTRIB- UTORY OR ASSOCIATED CONDITION	230
CLI DATA ON SHOCK IN ITS INCIDENCE AS A CONTRIBUTORY OR ASSOCIATED CONDITION	231
CLII INTRACRANIAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	232
CLIII MAXILLOFACIAL AND CERVICAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	233
CLIV INTRAVERTEBRAL AND EXTREMITY CONTRIBUTORY OR ASSOCIATED CONDITIONS	234
CLV THORACIC CONTRIBUTORY OR ASSOCIATED CONDITIONS	235
CLVI ABDOMINAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	237
CLVII CLOSTRIDIAL MYOSITIS AS A CONTRIBUTORY OR ASSOCIATED CONDITION	241
CLVIII EMBOLISM, INFARCTION, AND THROMBOSIS AS CONTRIBUTORY OR ASSOCIATED CONDITIONS	242
CLIX MISCELLANEOUS DATA	243

TABLE OF CONTENTS

Table	Page
Causes of Death in Those Cases in Which the Principal Wound Was Abdominal Wall:	244
CLX IMMEDIATE CAUSE OF DEATH	245
CLXI TABLE OF CONTRIBUTORY OR ASSOCIATED CONDITIONS OF WHICH NONE WERE REPORTED	246
CLXII INTRAVERTEBRAL AND EXTREMITY CONTRIBUTORY OR ASSOCIATED CONDITIONS	247
CLXIII THORACIC CONTRIBUTORY OR ASSOCIATED CONDITIONS	248
CLXIV ABDOMINAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	249
CLXV CLOSTRIDIAL MYOSITIS AS A CONTRIBUTORY OR ASSOCIATED CONDITION	250
CLXVI EMBOLISM, INFARCTION, AND THROMBOSIS AS CONTRIBUTORY OR ASSOCIATED CONDITIONS	251
CLXVII MISCELLANEOUS DATA	252
Causes of Death in Those Cases in Which the Principal Wound Was Upper Extremity, Soft Tissue Only:	253
CLXVIII IMMEDIATE CAUSE OF DEATH	254
CLXIX THE ETIOLOGY OF SHOCK IN ITS INCIDENCE AS A CONTRIBUTORY OR ASSOCIATED CONDITION	255
CLXX DATA ON SHOCK IN ITS INCIDENCE AS A CONTRIBUTORY OR ASSOCIATED CONDITION	256
CLXXI INTRACRANIAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	257
CLXXII MAXILLOFACIAL AND CERVICAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	258

TABLE OF CONTENTS

Table	Page
CLXXIII INTRAVERTEBRAL AND EXTREMITY CONTRIBUTORY OR ASSOCIATED CONDITIONS	259
CLXXIV THORACIC CONTRIBUTORY OR ASSOCIATED CONDITIONS	260
CLXXV ABDOMINAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	261
CLXXVI CLOSTRIDIAL MYOSITIS AS A CONTRIBUTORY OR ASSOCIATED CONDITION	262
CLXXVII EMBOLISM, INFARCTION, AND THROMBOSIS AS CONTRIBUTORY OR ASSOCIATED CONDITIONS	263
CLXXVIII MISCELLANEOUS DATA	264
Causes of Death in Those Cases in Which the Principal Wound Was Upper Extremity, Bone and Soft Tissue:	265
CLXXIX IMMEDIATE CAUSE OF DEATH	266
CLXXX THE ETIOLOGY OF SHOCK IN ITS INCIDENCE AS A CONTRIBUTORY OR ASSOCIATED CONDITION	267
CLXXXI DATA ON SHOCK IN ITS INCIDENCE AS A CONTRIBUTORY OR ASSOCIATED CONDITION	268
CLXXXII INTRACRANIAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	269
CLXXXIII MAXILLOFACIAL AND CERVICAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	270
CLXXXIV INTRAVERTEBRAL AND EXTREMITY CONTRIBUTORY OR ASSOCIATED CONDITIONS	271
CLXXXV THORACIC CONTRIBUTORY OR ASSOCIATED CONDITIONS	272
CLXXXVI ABDOMINAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	273
CLXXXVII CLOSTRIDIAL MYOSITIS AS A CONTRIBUTORY OR ASSOCIATED CONDITION	274

TABLE OF CONTENTS

Table	Page
CLXXXVIII EMBOLISM, INFARCTION, AND THROMBOSIS AS CONTRIBUTORY OR ASSOCIATED CONDITIONS	275
CLXXXIX MISCELLANEOUS DATA	276
Causes of Death in Those Cases in Which the Principal Wound Was Lower Extremity, Soft Tissue Only:	
CXC IMMEDIATE CAUSE OF DEATH	278
CXCI THE ETIOLOGY OF SHOCK IN ITS INCIDENCE AS A CONTRIBUTORY OR ASSOCIATED CONDITION	279
CXCII DATA ON SHOCK IN ITS INCIDENCE AS A CONTRIBUTORY OR ASSOCIATED CONDITION	280
CXCIII INTRACRANIAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	281
CXCIV MAXILLOFACIAL AND CERVICAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	282
CXCV INTRAVERTEBRAL AND EXTREMITY CONTRIBUTORY OR ASSOCIATED CONDITIONS	283
CXCVI THORACIC CONTRIBUTORY OR ASSOCIATED CONDITIONS	284
CXCVII ABDOMINAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	285
CXCVIII CLOSTRIDIAL MYOSITIS AS A CONTRIBUTORY OR ASSOCIATED CONDITION	286
CXCIX EMBOLISM, INFARCTION, AND THROMBOSIS AS CONTRIBUTORY OR ASSOCIATED CONDITIONS	287
CC MISCELLANEOUS DATA	288

TABLE OF CONTENTS

Table	Page
Causes of Death in Those Cases in Which the Principal Wound Was Lower Extremity, Bone and Soft Tissue:	289
CCI IMMEDIATE CAUSE OF DEATH	290
CCII THE ETIOLOGY OF SHOCK IN ITS INCIDENCE AS A CONTRIBUTORY OR ASSOCIATED CONDITION	291
CCIII DATA ON SHOCK IN ITS INCIDENCE AS A CONTRIBUTORY OR ASSOCIATED CONDITION	292
CCIV INTRACRANIAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	293
CCV MAXILLOFACIAL AND CERVICAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	294
CCVI INTRAVERTEBRAL AND EXTREMITY CONTRIBUTORY OR ASSOCIATED CONDITIONS	295
CCVII THORACIC CONTRIBUTORY OR ASSOCIATED CONDITIONS	296
CCVIII ABDOMINAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	298
CCVIX CLOSTRIDIAL MYOSITIS AS A CONTRIBUTORY OR ASSOCIATED CONDITION	300
CCX EMBOLISM, INFARCTION, AND THROMBOSIS AS CONTRIBUTORY OR ASSOCIATED CONDITIONS	301
CCXI MISCELLANEOUS DATA	302
Causes of Death in Those Cases in Which the Principal Wound Was Unclassified, Multiple:	303
CCXII IMMEDIATE CAUSE OF DEATH	304
CCXIII THE ETIOLOGY OF SHOCK IN ITS INCIDENCE AS A CONTRIBUTORY OR ASSOCIATED CONDITION	305

TABLE OF CONTENTS

Table	Page
CCXIV DATA ON SHOCK IN ITS INCIDENCE AS A CONTRIBUTORY OR ASSOCIATED CONDITION	306
CCXV INTRACRANIAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	307
CCXVI MAXILLOFACIAL AND CERVICAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	308
CCXVII INTRAVERTEBRAL AND EXTREMITY CONTRIBUTORY OR ASSOCIATED CONDITIONS	309
CCXVIII THORACIC CONTRIBUTORY OR ASSOCIATED CONDITIONS	310
CCXIX ABDOMINAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	313
CCXX CLOSTRIDIAL MYOSITIS AS A CONTRIBUTORY OR ASSOCIATED CONDITION	315
CCXXI EMBOLISM, INFARCTION, AND THROMBOSIS AS CONTRIBUTORY OR ASSOCIATED CONDITIONS	316
CCXXII MISCELLANEOUS DATA	317

TABLE OF CONTENTS

VOLUME THREE

Table

Page

SECTION IV

SPECIAL STUDIES ON

INTRA-ABDOMINAL WOUNDS

318

Preliminary Remarks

319

Part 1

Those Cases in Which the Principal Wound Was Intra-
abdominal and the Immediate Cause of Death Was
Shock (178 Cases)

323

CCXXIII DATA RELATIVE TO HOSPITAL ADMISSION, ANESTHESIA, AND
SURGERY

324

CCXXIV CAUSATIVE AGENT AND TYPE OF WOUND

325

CCXXV ETIOLOGY OF SHOCK

326

CCXXVI COMPARISON OF CASES WITH AND WITHOUT PERITONEAL
CONTAMINATION

327

CCXXVII ADMISSION BLOOD PRESSURE AND LOWEST RECORDED BLOOD
PRESSURE

328

CCXXVIII INCIDENCE OF ASSOCIATED WOUNDS

329

CCXXIX ANESTHETIC AGENTS USED IN CASES DYING DURING
ANESTHETIC INDUCTION, DURING SURGERY, AND
AFTER SURGERY

330

TABLE OF CONTENTS

Table	Page
CCXXX OPERATING TIME IN CASES DYING DURING OR AFTER SURGERY	331
CCXXXI PLASMA THERAPY PRIOR TO ADMISSION	332
Remarks	333
CCXXXII PLASMA THERAPY AFTER ADMISSION BUT BEFORE SURGERY	334
CCXXXIII PLASMA THERAPY DURING SURGERY	335
CCXXXIV PLASMA THERAPY AFTER SURGERY	336
CCXXXV BLOOD TRANSFUSION THERAPY BEFORE SURGERY	337
CCXXXVI BLOOD TRANSFUSION THERAPY DURING SURGERY	338
CCXXXVII BLOOD TRANSFUSION THERAPY AFTER SURGERY	339
CCXXXVIII TIME LAGS: WOUNDING TO DEATH IN CASES DEAD ON ARRIVAL OR DYING ON ADMISSION	340
CCXXXIX TIME LAGS: WOUNDING TO DEATH IN CASES LIVING AT LEAST ONE HOUR AFTER ADMISSION BUT DYING BEFORE ANESTHESIA	341
CCXL TIME LAGS: WOUNDING TO DEATH IN CASES DYING DURING ANESTHETIC INDUCTION	342
CCXLI TIME LAGS: ADMISSION TO SURGERY IN FIELD AND EVACUATION HOSPITALS IN CASES DYING DURING PRIMARY SURGERY	343
Remarks	344
CCXLII TIME LAGS: WOUNDING TO DEATH IN CASES DYING DURING PRIMARY SURGERY	345
CCXLIII TIME LAGS: WOUNDING TO ADMISSION TO FIELD AND EVACUATION HOSPITALS IN CASES DYING AFTER PRIMARY SURGERY	346

TABLE OF CONTENTS

Table	Page
CCXLIV TIME LAGS: ADMISSION TO SURGERY IN FIELD AND EVACUATION HOSPITALS IN CASES DYING AFTER PRIMARY SURGERY	347
CCXLV TIME LAGS: SURGERY TO DEATH IN FIELD HOSPITALS IN CASES DYING AFTER PRIMARY SURGERY	348
CCXLVI TIME LAGS: SURGERY TO DEATH IN EVACUATION HOSPITALS IN CASES DYING AFTER PRIMARY SURGERY	349
CCXLVII MISCELLANEOUS DATA	350
CCXLVIII PLASMA AND BLOOD TRANSFUSION THERAPY IN THE 13 CASES EXHIBITING PULMONARY EDEMA	351
CCXLIX MISCELLANEOUS DATA ON THE 13 CASES EXHIBITING PULMONARY EDEMA	352

Part 2

Those Cases in Which the Principal Wound Was Intra- abdominal and the Immediate Cause of Death Was Not Shock (230 Cases)	353
CCL DATA RELATIVE TO HOSPITAL ADMISSION, ANESTHESIA, AND SURGERY	354
CCLI INCIDENCE OF SHOCK AS A CONTRIBUTORY OR ASSOCIATED CONDITION	355
CCLII FURTHER ANALYSIS OF SHOCK AS A CONTRIBUTORY OR ASSOCIATED CONDITION	356
CCLIII MISCELLANEOUS FINDINGS IN CASES IN WHICH SHOCK WAS A CONTRIBUTORY OR ASSOCIATED CONDITION	357

TABLE OF CONTENTS

Table	Page
CCLIV ADMISSION BLOOD PRESSURE AND LOWEST RECORDED BLOOD PRESSURE IN CASES IN WHICH SHOCK WAS A CONTRIBUTORY FACTOR	358
CCLV INCIDENCE OF ASSOCIATED WOUNDS	359
CCLVI ANESTHETIC AGENTS USED IN CASES DYING DURING ANESTHESIA, DURING SURGERY, AND AFTER SURGERY	360
CCLVII TIME LAGS: WOUNDING TO ADMISSION TO FIELD HOSPITALS	361
CCLVIII TIME LAGS: WOUNDING TO ADMISSION TO EVACUATION HOSPITALS	362
CCLIX TIME LAGS: ADMISSION TO SURGERY IN FIELD HOSPITALS	363
CCLX TIME LAGS: ADMISSION TO SURGERY IN EVACUATION HOSPITALS	364
CCLXI TIME LAGS: SURGERY TO DEATH IN FIELD HOSPITAL CASES	365
CCLXII TIME LAGS: SURGERY TO DEATH IN EVACUATION HOSPITAL CASES	366

Part 3

Those Cases in Which the Principal Wound Was Intra-abdominal and Peritonitis Was Evident or Suspect to Be Present	367
---	-----

Remarks	368
---------	-----

CCLXIII DATA RELATIVE TO HOSPITAL ADMISSION, ANESTHESIA, AND SURGERY	369
--	-----

TABLE OF CONTENTS

Table	Page
CCLXIV OPERATING TIME FOR PRIMARY SURGERY	370
CCLXV DATA RELATIVE TO PRIMARY SURGERY	371
CCLXVI SECONDARY OPERATIONS AND OXYGEN THERAPY	372
CCLXVII DATA ON CHEMOTHERAPY	373
CCLXVIII ADMISSION BLOOD PRESSURE	374
CCLXIX SHOCK DATA	375
CCLXX DATA ON URINARY EXCRETION	376
CCLXXI NUMBER OF AUTOPSIES	377
CCLXXII IMMEDIATE CAUSE OF DEATH	378
CCLXXIII ETIOLOGY OF SHOCK AS A CONTRIBUTORY OR ASSOCIATED CONDITION	379
CCLXXIV DATA ON SHOCK IN ITS INCIDENCE AS A CONTRIBUTORY OR ASSOCIATED CONDITION	380
CCLXXV INTRACRANIAL, MAXILLOFACIAL, CERVICAL, INTRAVERTEBRAL, AND EXTREMITY CONTRIBUTORY OR ASSOCIATED CONDITIONS	381
CCLXXVI THORACIC CONTRIBUTORY OR ASSOCIATED CONDITIONS	382
CCLXXVII ABDOMINAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	384
CCLXXVIII CLOSTRIDIAL MYOSITIS AS A CONTRIBUTORY OR ASSOCIAT- ED CONDITION	387
CCLXXIX EMBOLISM, INFARCTION, AND THROMBOSIS AS CONTRIB- UTORY OR ASSOCIATED CONDITIONS	388
CCLXXX MISCELLANEOUS DATA	389

TABLE OF CONTENTS

Table		Page
	TIME LAGS IN THOSE CASES IN WHICH PERITONITIS WAS THE IMMEDIATE CAUSE OF DEATH:	390
CCLXXXI	WOUNDING TO FIELD HOSPITALS	390
CCLXXXII	WOUNDING TO EVACUATION HOSPITALS	391
CCLXXXIII	ADMISSION TO SURGERY IN FIELD HOSPITALS	392
CCLXXXIV	ADMISSION TO SURGERY IN EVACUATION HOSPITALS	393
CCLXXXV	SURGERY TO DEATH IN FIELD AND EVACUATION HOSPITALS	394
	TIME LAGS IN THOSE CASES IN WHICH PERITONITIS WAS CONTRIBUTORY BUT NOT THE IMMEDIATE CAUSE OF DEATH:	395
CCLXXXVI	WOUNDING TO FIELD HOSPITALS	395
CCLXXXVII	WOUNDING TO EVACUATION HOSPITALS	396
CCLXXXVIII	ADMISSION TO SURGERY IN FIELD HOSPITALS	397
CCLXXXIX	ADMISSION TO SURGERY IN EVACUATION HOSPITALS	398
CCXC	SURGERY TO DEATH IN FIELD AND EVACUATION HOSPITALS	399

TABLE OF CONTENTS

Table

Page

SECTION V

SPECIAL STUDIES ON ALL THE CASES
(523) IN WHICH THE IMMEDIATE CAUSE
OF DEATH WAS SHOCK

402

Preliminary Remarks

403

CCXC I LOCATION OF THE PRINCIPAL WOUND

404

CCXC II DATA RELATIVE TO HOSPITAL ADMISSION, ANESTHESIA,
AND SURGERY

405

CCXC III ETIOLOGY OF SHOCK

406

CCXC IV ADMISSION BLOOD PRESURE

407

CCXC V LOWEST RECORDED BLOOD PRESSURE

408

CCXC VI PLASMA THERAPY BEFORE ADMISSION

409

CCXC VII PLASMA THERAPY AFTER ADMISSION, BEFORE SURGERY

410

CCXC VIII PLASMA THERAPY DURING SURGERY

411

CCXC IX PLASMA THERAPY AFTER SURGERY

411

CCC BLOOD THERAPY BEFORE SURGERY

412

CCCI BLOOD THERAPY DURING SURGERY

413

CCCI BLOOD THERAPY AFTER SURGERY

413

CCCI II PRIMARY OPERATIONS PERFORMED

414

CCCI V DEBRIDEMENT ASSOCIATED WITH PRIMARY OPERATION

415

CCCV SUBSIDIARY OPERATION AT TIME OF PRIMARY OPERATION

416

TABLE OF CONTENTS

Table	Page
CCCVI OPERATING TIME FOR PRIMARY SURGERY	417
CCCVII SECONDARY (LATER) OPERATIONS	418
CCCVIII ANESTHESIA FOR PRIMARY SURGERY	419
CCCIX ANESTHESIA FOR SECONDARY SURGERY	419
CCCX OXYGEN THERAPY	420
CCCXI URINARY EXCRETION AND UREMIA	420
CCCXII CHEMOTHERAPY	421
CCCXIII AUTOPSIES PERFORMED	421
CCCXIV MISCELLANEOUS OBSERVATIONS	422
CCCXV INTRACRANIAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	423
CCCXVI MAXILLOFACIAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	424
CCCXVII CERVICAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	424
CCCXVIII SPINAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	425
CCCXIX EXTREMITY CONTRIBUTORY OR ASSOCIATED CONDITIONS	425
CCCXX THORACIC CONTRIBUTORY OR ASSOCIATED CONDITIONS	426
CCCXXI ABDOMINAL CONTRIBUTORY OR ASSOCIATED CONDITIONS	429
CCCXXII MISCELLANEOUS CONTRIBUTORY OR ASSOCIATED CONDITIONS	431
CCCXXIII EMBOLISM, INFARCTION, AND THROMBOSIS AS CONTRIBUTORY OR ASSOCIATED CONDITIONS	432

TABLE OF CONTENTS

Table	Page
TIME LAGS IN CASES DEAD ON ARRIVAL OR DYING ON ADMISSION:	433
CCCXXIV WOUNDING TO DEATH	433
TIME LAGS IN CASES LIVING AT LEAST ONE HOUR AFTER ADMISSION BUT DYING BEFORE ANESTHESIA:	434
CCCXXV WOUNDING TO FIELD HOSPITAL	434
CCCXXVI WOUNDING TO EVACUATION HOSPITAL	435
CCCXXVII WOUNDING TO DEATH IN FIELD HOSPITAL CASES	436
CCCXXVIII WOUNDING TO DEATH IN EVACUATION HOSPITAL CASES	437
TIME LAGS IN CASES DYING DURING ANESTHETIC INDUCTION --- COMPARISON OF FIELD AND EVACUATION HOSPITAL CASES:	438
CCCXXIX WOUNDING TO HOSPITAL ADMISSION, ADMISSION TO SURGERY, AND WOUNDING TO DEATH	438
TIME LAGS IN CASES DYING DURING PRIMARY SURGERY --- COMPARISON OF FIELD AND EVACUATION HOSPITAL CASES:	439
CCCXXX WOUNDING TO ADMISSION	439
CCCXXXI ADMISSION TO SURGERY	440
CCCXXXII WOUNDING TO DEATH	441
TIME LAGS IN CASES DYING AFTER PRIMARY SURGERY --- COMPARISON OF FIELD AND EVACUATION HOSPITAL CASES:	442
CCCXXXIII WOUNDING TO ADMISSION	442
CCCXXXIV ADMISSION TO SURGERY	443

TABLE OF CONTENTS

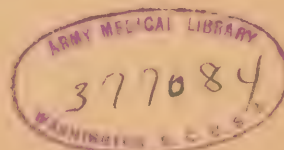
Table		Page
CCCCXXV	SURGERY TO DEATH IN FIELD HOSPITALS	444
CCCCXXVI	SURGERY TO DEATH IN EVACUATION HOSPITALS	445
CCCCXXVII	WOUNDING TO DEATH IN FIELD HOSPITALS	446
CCCCXXVIII	WOUNDING TO DEATH IN EVACUATION HOSPITALS	447

SECTION VI

APPENDICES	448
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Appendix

A	DISTRIBUTION OF FIFTH ARMY BATTLE CASUALTY DEATHS NOT STUDIED IN THIS REPORT	449
B	CORRECTION OF TOTAL BATTLE CASUALTY ADMISSION FIGURES FOR EACH PERIOD TO AGREE WITH PROPORTION OF TOTAL DEATHS THAT WERE ANALYZED FOR THIS REPORT	450
C	DISTRIBUTION OF ASSOCIATED WOUNDS RELATED TO REGION OF THE PRINCIPAL WOUND	451
D	FURTHER CLASSIFICATION OF CASES WITH PRINCIPAL WOUNDS OF CHEST TO SHOW HEMITHORAX INVOLVED AND RELATIVE IMPORTANCE OF ABDOMINAL AND THORACIC COMPONENTS WHEN BOTH WERE PRESENT	454
E	DISTRIBUTION AMONG FIFTH ARMY FIELD AND EVACUATION HOSPITALS OF THE 1450 BATTLE CASUALTY FATALITIES STUDIED	455
F	POSTMORTEM STUDIES BY PERIODS	457



VOLUME ONE

* * * *

INTRODUCTION

STUDY OF FIFTH ARMY HOSPITAL BATTLE CASUALTY DEATHS

A PRELIMINARY REPORT

INTRODUCTION

From the 1st of January 1944 until the surrender of German Armies in Italy on the 2nd of May 1945, 91,631* of the American Soldiers serving in Fifth Army were killed, wounded, or injured in action. Of these 16,618† died on the battlefield or before reaching a hospital installation. Many were treated and returned to duty from the division area. A few were admitted directly to Base Hospitals. Of the remaining, 63,024** who were admitted to Fifth Army hospitals, only 1631** died therein. Records of 1411 or 86.47% of these hospital battle casualty deaths were available for this study. In addition the records of thirty nine (39) who were dead on arrival at a hospital were utilized in many sections of this report. Gross post-mortem findings formed a part of 775 of these records. Microscopic autopsy reports were received on 340. Most of the clinical records were fairly complete. In some, however, much desirable information was missing.

The study was made with the assistance of machine records methods. A vast amount of statistical material has been assembled. In this preliminary report, no attempt is made to discuss in detail the analytical and statistical findings. A table of contents is included which is of value in utilizing the report for reference work. A brief discussion precedes the tables in each of the main sections, and in some instances, the subsections, and individual tables, of the report.

* Adjutant General's figures - Killed in Action plus Wounded in Action.

** Figures from MTOUSA M.D. Form 86f.

† Combination KIA (AG) plus DOW (AG) minus hospital B.C. deaths (86f)

It may be assumed that the 1411 hospital battle casualty deaths studied are truly representative of the total of 1631 who (according to MCOUSA Form 86f) died in Fifth Army hospitals. Beginning 1 Jan 1944 the Surgeon, Fifth Army, requested submission of a complete record on all battle casualties dying in Fifth Army hospitals. From the 1 Jan 1944 to 2 May 1945, the Wound Classification Report submitted by the hospitals listed 58,677 battle casualty admissions and 1562 battle casualty deaths in hospitals. Appendix A lists the hospitals and shows by period the missing cases for each hospital. Some of the missing battle casualty death reports were never submitted. Some were not on hand at the time this study was initiated.

The figures secured from the hospital Wound Classification Reports, however, are lower than those reported on the MCOUSA Form 86f. From the latter, the figure for battle casualty hospital admissions is 63,024 and for battle casualty hospital deaths is 1631. These larger figures have been used in setting 86.47% as the portion studied, of all the hospital battle casualty deaths, and have been correspondingly reduced when calculating percentage mortalities. In calculating percentages of total battle casualties, or battle casualty hospital admissions, by period, correction has been made for the percentage of cases studied during each period. (See Appendix B)

The Adjutant General's figures and the MCOUSA M.D. Form 86f includes the injured in action as well as the wounded in action (WIA) and killed in action (KIA). Of the deaths studied only a few who had crush injuries might be regarded as injured rather than wounded in action. All of these crush injuries (20) resulted from falling stones or bricks, set in motion

by the explosion of an enemy shell and most of these had wounds in addition to crush injury. It may be said then, that the deaths studied represent a considerably larger percentage of wounded in action who died, than the percentage of 86.47% which is based upon the total (1631) of wounded and injured in action who died in Fifth Army hospitals during the period studied.

The breakdown of injured in action and wounded in action is not available for either hospital battle casualty admissions, or for the total resulting from the sum of the Adjutant General's figures on wounded in action plus killed in action.

The thirty nine (39) records of battle casualties dead on arrival at a hospital comprise all the records submitted on this class of deaths. Statistics are not available to determine their percentage of the entire group of "DOA's". Most of them were unquestionably patients whom the last medical officer who saw them, expected to reach the hospital alive. This group has been included in the Wound Classification Tables, Causes of Death Tables, and in many instances has been singled out for individual study as compared to those who died shortly after admission, before anesthesia, during anesthetic induction, during primary surgery, and after primary surgery. The cases have not been included in tables dealing with "Hospital Battle Casualty Deaths" or in any of the percentage tables based on hospital battle casualty admissions, or the total of wounded in action plus killed in action.

The information recorded in the tables of this report was first recorded in code form so that it might be transferred to machine records

cards. Study of the cases and the primary recording of these data consumed the entire time of one of us, for a period of a little over three months. The other of us studied each case, and checked the recorded data. Each item was carefully weighed, matters calling for opinion were discussed, and all questionable data were recorded as questionable. The completed machine records cards were checked by hand for accuracy. The cards were punched by our own clerk. All machine counting and recording of data was done by the two of us and the same clerk. Many checks were made on the validity of the machine tabulations. The writers feel that the margin of error in this method was no greater than, if as great as, the personal error in manual counting.

More data were accumulated than are presented in this preliminary report. Figures on time lags are available on all cases in which the information was in the record. Studies on all cases with Nephropathies, fat embolism, shock, thoraco-abdominal wounds, and intra-thoracic wounds have been made. These studies are comparable in scope to that study on cases with intra-abdominal wounds which is presented in this report.

It is hoped that the statistical information in this preliminary report will be of value to those studying and writing upon war surgery now.

SECTION I

REGION, TYPE, AND DISTRIBUTION OF WOUNDS
AND
CERTAIN GENERAL CONSIDERATIONS

The simple classification of cases by region of principal wound in Table I is presented for comparison with similar tables, on hospital battle casualty admissions, as well as deaths, which are available for all of the Tunisian, Sicilian and Italian Campaigns.

Tables II and III present some very interesting data worthy of some discussion. It must be remembered that casualties at the Anzio Beachhead* were included in the first two periods, and unquestionably increased the percentage of those dying before anesthesia and the total hospital battle casualty mortality in the first two periods. The reduction in the latter mortality figure from 3.94% in the first period to 2.04% in the last is dependent on more than the Anzio factor. The reduction in the percentage of those dying before anesthesia is in part due to general adoption of improved methods of resuscitation, and a more available supply of blood.

Morrissey** has called attention to the direct relationship of the percentage mortality of battle casualties admitted to hospitals, the percentage mortality of battle casualties admitted to hospitals dying before anesthesia, and the percentage hospital battle casualty deaths comprise of the total who die of wounds (includes killed in action, died of wounds). He has shown that the latter percentage varies widely. At Anzio, 16% of all battle casualty deaths occurred in hospitals. (The hospital mortality was 5.7%). In May 1944 4.21% of all battle casualty deaths died in hospitals (hospital mortality 1.7%. In June 1944, 15%

* 22 Jan 1944 to 25 May 1944

** See Table IV page 11 of this report and Appendix of History of Fifth Army Medical Service, 1945.

of all battle casualty deaths were in hospitals (hospital mortality 2.8%). In October 1944, 7.65% of all battle casualty deaths were in hospitals, (hospital mortality 2.1%). When evacuation to the forward hospital of the wounded is easily accomplished the hospital mortality rises. Thus hospital mortality tends to vary inversely with the percentage who are killed in action or die of wounds before reaching a hospital. However, Morrissey further shows in Table IV that there has been a steady, gradual decrease in the percentage, the deaths occurring during and after surgery, comprise of total battle casualty deaths. Table III shows a slight increase throughout the four periods in the percentage deaths during surgery comprise of the deaths studied, but a decrease in the percentage these deaths comprise of battle casualties admitted to hospitals.

Table V lists battle casualty deaths according to principal wound groups. These figures may be compared with those in Fifth Army Wound Classification reports since 1 August 1944. Many of the Tables in all sections deal with various factors in relation to these fourteen (14) principal wound groups.

TABLE I

BATTLE CASUALTY DEATHS (1450 cases)
DISTRIBUTION BY REGION OF PRINCIPAL WOUND

Abdomen	543
Head	297
Chest	277
Lower Extremity	145
Spine	27
Neck	25
Upper Extremity	14
Face and Jaws	8
Unclassified Multiple Wounds	<u>114</u>
TOTAL	1450

TABLE II

DEATHS AS RELATED TO HOSPITAL ADMISSION, ANESTHESIA
AND SURGERY

	JAN-MAR 1944	APR-JULY 1944	AUG-DEC 1944	JAN-MAY 1945	TOTAL
Dead on Arrival	7	16	9	7	39
Dying on Admission.					
Lived less than 1 hour	27	27	12	8	74
Died before Anesthesia Excludes those DOA & those dying on admission	157	108	48	24	337
Died during anesthetic induction	8	3	4	1	16
Died during primary surgery	20	25	19	11	75
Died after primary surgery	310	303	192	104	909
TOTAL	529	482	284	155	1450

TABLE III

HOSPITAL BATTLE CASUALTY ADMISSIONS DYING BEFORE ANESTHESIA* AS
 COMPARED WITH THOSE DYING DURING ANESTHESIA OR SURGERY AND
 WITH THE TOTAL** BATTLE CASUALTY DEATHS IN ARMY HOSPITALS

	Jan Mar 1944	Apr Jul 1944	Aug Dec 1944	Jan May 1945	Total
Deaths studied*	522	466	275	148	1411
Deaths before anesthesia	184	135	60	32	411
Deaths during anesthesia or surgery	28	28	23	12	91
Percentage of deaths studied who died before anesthesia	35.3%	29.0%	21.8%	21.6%	29.1%
Percentage of deaths studied who died during anesthesia or surgery	5.36%	6.09%	8.36%	8.20%	6.45%
Total battle casualty admissions**	13282	19876	13464	7082	54514
Percentage of battle casualty admissions who died before anesthesia	1.39%	0.68%	0.44%	0.44%	0.752%
Percentage of battle casualty admissions who died during anesthesia or surgery	0.211%	0.141%	0.171%	0.165%	0.167%
Total percentage of battle casualty admissions who died in Army hospitals	3.94%	2.34%	2.05%	2.04%	2.59%

(*) Excludes Dead on Arrival

(**) Corrected to allow for percentage of deaths not studied during each period. See Appendix B

TABLE IV

DEMONSTRATION OF EFFECT OF INCREASED EFFICIENCY OF EVACUATION FROM FORWARD AREAS ON HOSPITAL MORTALITY (AN INCREASE) AND THE REMAINING FAVORABLE TREND AFTER EXCLUSION OF THOSE CASES* DYING BEFORE ANESTHESIA

	JAN. MAR 1944	APR. JUL 1944	AUG. DEC 1944	JAN. MAY 1945
Total killed, wounded, and injured in action	24,351	32,026	22,469	12,556
Total killed in action plus died of wounds** (total battle casualty deaths)	5,042	6,366	4,234	2,506
Percent mortality of the killed, wounded, and injured in action	20.70%	19.88%	18.84%	19.96%
Total battle casualties admitted to hospitals	14,408	23,111	16,221	9,194
Total battle casualties dying in hosp.	570	542	332	205
Percent mortality of battle casualties admitted to hospitals	3.94%	2.34%	2.05%	2.04%
Percent of total battle casualty deaths dying in hospitals	11.3%	8.5%	7.8%	6.8%
Percent of hospital battle casualty deaths who died prior to anesthesia	35.3%	29.0%	21.8%	21.6%
Percent of hospital battle casualty deaths who died after reaching anesthesia	7.3%	6.2%	6.14%	5.3%
Percent of total killed, wounded, and injured in action who died after reaching anesthesia	1.515%	1.200%	1.160%	1.050%

*A variable quantity influenced by conditions affecting efficiency of evacuation to hospitals as well as by professional care before and after admission.

**Does not include those few deaths which occurred in base hospitals.

Note: This table was conceived and prepared by Major Richard A. Morrissey, SnC., Statistician, Fifth Army Surgeon's Office.

TABLE V

BATTLE CASUALTY DEATHS LISTED AS TO PRINCIPAL WOUND

I. Intra-abdominal (Abd)	408
II. Intracranial (Cran)	297
III. Thoraco-abdominal (Th Abd)*	212
IV. Intrathoracic (Thor)*	138
V. Lower extremity, with bone involvement (LE, B)	114
VI. Unclassified, multiple wounds (Un MW)	114
VII. Combined intra-abdominal & intrathoracic (CoA & T)*	59
VIII. Lower extremity, soft tissue only (LE, S)	31
IX. Intravertebral (Spin)	27
X. Cervical (Cerv)	25
XI. Upper extremity, with bone involvement (UE, B)	10
XII. Maxillofacial, with bone involvement (MaxF)	8
XIII. Upper extremity, soft tissue only (UE, S)	4
XIV. Abdominal wall (AbdW)	3
TOTAL	<u>1450</u>

Note: In Appendix C the above groups of cases are represented simply by the corresponding Roman numeral and abbreviations listed above.

* More detailed classification of these 3 groups depicted in Appendix D.

TABLE VI

CAUSATIVE AGENTS AS RELATED TO PRINCIPAL WOUNDS (1)

MISSILE	Bullet, unclas- sified	Bullet, rifle	Bullet, machine gun	High ex- plosive, unclas- sified	High ex- plosive, shell	High ex- plosive, mine
PRINCIPAL WOUND:						
Intracranial	19	8	6	37	181	10
Intravertebral	2	2	2	2	14	0
Maxillofacial	0	0	1	1	4	0
Cervical	3	0	2	4	13	1
Intrathoracic	20	1	9	12	79	2
Thoraco-abdominal	35	7	7	11	130	10
Combined intra-abdom. & intrathoracic	2	1	0	8	37	4
Intra-abdominal	54	11	15	40	254	9
Abdominal wall only	0	0	0	0	3	0
Upper ext. soft tissue only	0	0	0	0	2	0
Upper ext. bone & soft tissue	0	0	0	4	6	0
Lower ext. soft tissue only	5	0	1	5	14	2
Lower ext. bone & soft tissue	2	0	2	21	59	19
Unclassified, multiple	1	1	0	15	65	13
TOTAL	143	31	45	160	861	70

Continued next page

TABLE VII

CAUSATIVE AGENTS (2) AND CHARACTER OF WOUNDS

MISSILE	High ex- plosive, booby trap	H.E., bomb	V. E., blast	No record of agent	Pen.* wd.	Perf. / wd.
PRINCIPAL WOUND:						
Intracranial	0	17	2	17	199	42
Intravertebral	0	2	0	3	19	5
Maxillofacial	0	0	1	1	4	1
Cervical	0	2	0	0	16	1
Intrathoracic	0	4	1	10	94	33
Thoraco-abdominal	0	8	0	4	152	67
Combined intra-abdominal & intrathoracic	0	3	2	2	47	11
Intra-abdominal	0	12	1	12	287	126
Abdominal wall only	0	0	0	0	2	0
Upper ext. soft tissue only	0	0	0	2	3	0
Upper ext. bone & soft tissue	0	0	0	0	5	1
Lower ext. soft tissue only	0	2	1	1	12	7
Lower ext. bone & soft tissue	0	7	0	4	47	21
Unclassified, multiple	2	10	2	5	75	17
TOTAL	2	67	10	61	965	332

(*) Penetrating wound or wounds (number of cases - not number of wounds).

(/) Perforating wound or wounds (number of cases - not number of wounds).

TABLE VIII

HOSPITAL BATTLE CASUALTY DEATHS LISTED AS TO PRINCIPAL WOUND
WITH PERCENTAGE OF HOSPITAL BATTLE CASUALTY ADMISSIONS *

PRINCIPAL WOUND	No. of Deaths	Percent of total* Hosp. B.C. Admis- sions
I. Intra-abdominal	402	0.737%
II. Intracranial	288	0.528%
III. Thoraco-abdominal	210	0.385%
IV. Intrathoracic	131	0.241%
V. Lower extremity (Bone involvement)	110	0.202%
VI. Unclassified, multiple wounds	106	0.194%
VII. Combined intra-abdominal and intrathoracic	57	0.104%
VIII. Lower extremity, soft tissue only	30	0.055%
IX. Intravertebral	27	0.049%
X. Cervical	25	0.046%
XI. Upper extremity (Bone involvement)	10	0.018%
XII. Maxillofacial	8	0.014%
XIII. Upper extremity, soft tissue only	4	0.007%
XIV. Abdominal wall	3	0.005%
TOTAL	1411	2.59 %

(*) Figure of 63,024 admissions corrected to allow for 13.5% of hospital battle casualty deaths not studied. (DOA's not included).

TABLE IX

BATTLE CASUALTY DEATHS LISTED AS TO PRINCIPAL WOUND
AND RELATED TO HOSPITAL ADMISSION, ANESTHESIA, AND SURGERY

	Dead on arrival	Dying* on admission	Died † before Anesthesia	Died during anesthetic induction	Died during primary surgery	Died after primary surgery
PRINCIPAL WOUND:						
Intra-abdominal	6	12	45	8	20	317
Intracranial	9	17	142	0	6	123
Thoraco-abdominal	2	3	20	2	29	156
Intrathoracic	7	13	35	2	8	73
Lower ext. bone & soft tissue	4	14	18	0	5	73
Unclassified mul- tiple	8	7	45	2	3	49
Combined intra-ab- dominal & intrathoracic	2	3	6	1	2	45
Lower ext. soft tissue only	1	2	5	0	0	23
Intravertebral	0	0	10	0	0	17
Cervical	0	2	5	0	2	16
Upper ext. bone & soft tissue	0	1	2	0	0	7
Maxillofacial	0	0	0	1	0	7
Upper ext. soft tissue only	0	0	4	0	0	0
Abdominal wall only	0	0	0	0	0	3
TOTAL	39	74	337	16	75	909

GRAND TOTAL: 1450

* Lived less than one hour.

† Excluding those in first and second columns.

TABLE X

NUMBER OF CASES IN EACH PRINCIPAL WOUND GROUP BY PERIODS

	Jan.- Mar. <u>1944</u>	April- July <u>1944</u>	August- December <u>1944</u>	Jan.- May <u>1945</u>	Total
Intra-abdominal	152	134	86	36	408
Intracranial	104	86	60	47	297
Thoraco-Abdominal	65	79	44	24	212
Intrathoracic	51	47	29	11	138
Lower extremity, with bone involvement	49	41	17	7	114
Unclassified, multiple wounds	42	46	18	8	114
Combined intra-abdominal & intrathoracic	23	18	11	7	59
Lower extremity, soft tissue only	17	6	6	2	31
Intravertebral	7	5	9	6	27
Cervical	7	11	2	5	25
Upper extremity, with bone involvement	5	5	0	0	10
Maxillofacial, with bone involvement	2	3	1	2	8
Upper extremity, soft tissue only	2	1	1	0	4
Abdominal wall	<u>3</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>3</u>
TOTAL	529	482	284	155	1450

TABLE XI

PERCENTAGE OF CASTS IN EACH PRINCIPAL WOUND GROUP BY PERIODS

	Jan.- Mar 1944	April- July 1944	August- December 1944	Jan.- May 1945	Jan. 1944 thru May 1945
	<u>%</u>	<u>%</u>	<u>%</u>	<u>%</u>	<u>%</u>
Intra-abdominal	28.7	27.8	30.3	23.2	28.1
Intracranial	19.7	17.8	21.1	30.3	20.5
Thoraco-abdominal	12.3	16.4	15.5	15.5	14.6
Intrathoracic	9.6	9.7	10.2	7.1	9.5
Lower extremity, with bone involvement	9.3	8.5	6.0	4.5	7.8
Unclassified, multiple wounds	7.9	9.5	6.3	5.2	7.8
Combined intra-abdominal & intrathoracic	4.4	3.7	3.8	4.5	4.1
Lower extremity, soft tissue only	3.2	1.2	2.1	1.3	2.2
Intraspinal (i.e., intravertebral)	1.3	1.3	3.2	3.9	1.9
Cervical	1.3	2.3	0.7	3.2	1.7
Upper-extremity, with bone involvement	0.9	1.3	0.0	0.0	0.7
Maxillofacial, with bone involvement	0.4	0.3	0.4	1.3	0.6
Upper extremity, soft tissue only	0.4	0.2	0.4	0.0	0.3
Abdominal wall	0.6	0.0	0.0	0.0	0.2
TOTAL	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>

The remaining tables in Section I deal exclusively with principal and associated wounds. Table XII shows that only one-third of the cases in this series of deaths studied did not have wounds other than those confined to the region of the principal wound listed. It further gives the number and percentage of cases in each principal wound group in whom there were no associated wounds.

Tables XIII and XIV list the number of cases exhibiting each type of principal and associated wound. There are no duplications; a wound listed in one category does not appear in another.

Tables XV through XXIII represent in detail the regional distribution of associated wounds in relation to the site of the principal wound. The same information is presented in more compact form for reference in Appendix C. In all of these tables the figures indicate the number of cases exhibiting associated wounds of a particular type in a certain region rather than the number of individual wounds present in the event there were multiple wounds of the same type in any given region.

Tables XXIV and XXV show the reported incidence of arteries and nerves injured, whether in principal or associated wounds, excluding traumatic amputations. The figures here represent the number of individual arteries and nerves injured rather than the number of cases involved, except for the "multiple" columns, which indicate number of cases (the individual structures involved having been recorded under their appropriate headings). It should be emphasized that the reported incidence in these two tables probably is lower than the actual incidence, especially for the nerves.

TABLE XII

DISTRIBUTION ACCORDING TO PRINCIPAL WOUND OF CASES WITHOUT ASSOCIATED WOUNDS IN OTHER REGIONS, COMPARED WITH ALL CASES IN THE SERIES

	Cases without Associated Wounds	All Cases	Percentage
Intra-abdominal	131	408	32.1
Intracranial	138	297	46.5
Thoraco-abdominal	98	212	46.2
Intrathoracic	37	138	26.8
Lower extremity, with bone involvement	49*	114/	43.0
Unclassified, multiple wounds	0	114	0.0
Combined intra-abdominal & intrathoracic	7	59	11.9
Lower extremity, soft tissue only	14	31	45.2
Intraspinal (i.e., intravertebral)	1	27	3.7
Cervical	5	25	20.0
Upper-extremity, with bone involvement	2	10 ^x	20.0
Maxillofacial, with bone involvement	1	8	12.5
Upper extremity, soft tissue only	0	4	0.0
Abdominal wall	0	3	0.0
TOTAL	483	1450	33.3

* Including 17 traumatic amputations.

/ Including 43 traumatic amputations.

x Including 2 traumatic amputations.

TABLE XIII

PRINCIPAL AND ASSOCIATED WOUNDS:
NUMBER OF CASES EXHIBITING EACH TYPE

	Principal Wound	Associated Wound	Total
Intracranial	297	60	357
Eye or orbit: intracranial lesion present	0	25	25
Eye or orbit: no intracranial lesion present	0	45	45
Scalp only	0	27	27
Maxillofacial: bone & soft tissue	8	65	73
Maxillofacial: soft tissue only	0	114	114
Cervical: general	12	104	116
Cervical: with carotid artery involved	7	2	9
Cervical: with larynx or trachea involved	6	9	15
Spinal cord or intravertebral nerves	27	85	112
Chest wall only	0	86	86
Intrathoracic	130	94	232
Abdominal wall only	3	64	67
Intra-abdominal	408	20	428
Combined intra-abdominal & intrathoracic	59	10	69
Thoraco-abdominal	212	7	219
Upper extremity: bone & soft tissue	10	226	236
Upper extremity: soft tissue only	4	266	270
Lower extremity: bone & soft tissue	114	188	302
Lower extremity: soft tissue only	31	333	364
TOTAL:	1336	1830	3166

Unclassified cases (No principal wound selected)* 114Total Cases. 1750

*Multiple wounds present included in above categories of associated wounds.

TABLE XIV

REGIONAL DISTRIBUTION OF PRINCIPAL AND ASSOCIATED WOUNDS SHOWING THE NUMBER OF CASES EXHIBITING EACH* (1)

	Princi- pal wound	Associated wounds, evident	Total
1. HEAD			
Eye or orbit	0	25	25
Intracranial, known	297	60	357
Scalp (without known intracranial wound)	0	27	27
Subtotal:	297	112	409
2. FACE AND JAWS			
Bone and soft tissue	8	65	73
Eye or orbit	0	45	45
Soft tissue only	0	114	114
Subtotal:	8	224	232
3. NECK			
General (excluding spinal)	12	104	116
With carotid artery involved	7	2	9
With larynx or trachea involved	6	9	15
Subtotal:	25	115	140
4. SPINAL CORD OR INTERVARTERAL NERVES	27	85	112
5. CHEST			
Chest wall only	0	86	86
Combined intra-abdominal & intrathoracic	18	8	26
Intrathoracic, known	138	94	232
Thoraco-abdominal	121	5	126
Subtotal:	277	193	470
6. ABDOMEN			
Abdominal wall only	3	64	67
Combined intra-abdominal & intrathoracic	41	2	43
Intra-abdominal, known	408	20	428
Thoraco-abdominal	91	2	93
Subtotal:	543	88	631
7. Suspected associated wounds as follows:			
Intracranial	35		
Intrathoracic	61		
Intra-abdominal	30		
Total	126		

* Not the total number of wounds present

Continued next page

TABLE XIV Cont'd.

REGIONAL DISTRIBUTION OF PRINCIPAL AND ASSOCIATED WOUNDS SHOWING
THE NUMBER OF CASES EXHIBITING EACH (2)

	Principal Wound	Associated Wounds, Ident	Total
7. UPPER EXTREMITY			
Soft tissue only	3	256	259
Soft tissue & artery	0	5	5
Soft tissue & artery & bone	0	11	11
Soft tissue & artery & bone & nerve	1	1	2
Soft tissue & artery & nerve	1	2	3
Soft tissue & bone	6	189	195
Soft tissue & bone & nerve	1	8	9
Soft tissue & nerve	0	3	3
Traumatic amputation	2	17	19
Subtotal:	14	492	506
8. LOWER EXTREMITY			
Soft tissue only	17	316	333
Soft tissue & artery	12	12	24
Soft tissue & artery & bone	14	13	27
Soft tissue & artery & bone & nerve	3	2	5
Soft tissue & artery & nerve	1	0	1
Soft tissue & bone	53	145	198
Soft tissue & bone & nerve	1	6	7
Soft tissue & nerve	1	5	6
Traumatic amputation	43	22	65
Subtotal:	145	521	666
9. ARTERIES INJURED (excluding those in traumatic amputations)			
Axillary		4	
Brachial		13	
Femoral		28	
Intra-abdominal		32	
Intracranial (artery or venous sinus)		30	
Intrathoracic		9	
Multiple		5*	
Others		4	
Popliteal		8	
Radial or ulnar		4	
Subclavian		3	
Tibial or peroneal		20	
Subtotal:		155	155

* Not included in totals.

Continued on next page.

REGIONAL DISTRIBUTION OF PRINCIPAL AND ASSOCIATED WOUNDS SHOWING
THE NUMBER OF CASES EXHIBITING EACH (3)

	Princi- pal wound	Associated wounds, evident	TOTAL
10. NERVES INJURED (excluding those in traumatic amputations)			
Brachial plexus		8	
Femoral		2	
Median		4	
Multiple		6*	
Other nerve (extracranial or extraspinal)		4	
Other plexus		2	
Peroneal		2	
Radial		7	
Sciatic		10	
Tibial		6	
Ulnar		8	
Unclassified		1	
Subtotal:		54	54
11. TOTALS	1336	2039	3375
12. UNCLASSIFIED (as to principal wound)			
Multiple Wounds (included above among associated wounds)	114		
TOTAL CASES	1450		

* Not included in totals

TABLE XV

INCIDENCE ASSOCIATED WOUNDS AS
RELATED TO PRINCIPAL WOUNDS:
CASES WITH ASSOCIATED HEAD AND INTRAVERTEBRAL WOUNDS

ASSOCIATED WOUNDS	Intra- cranial, known	Intra- cranial, suspected	Eye or orbit associated with cranial wound	Scalp only	Intra- verte- bral (Spinal)
PRINCIPAL WOUND:					
Intracranial	0	0	22	0	2
Intravertebral	2	0	0	0	0
Maxillofacial	0	4	0	1	0
Cervical	1	0	30	1	0
Intrathoracic	2	6	0	5	22
Thoraco-abdominal	6	2	0	2	19
Combined intra-abdominal & intrathoracic	7	2	0	3	5
Intra-abdominal	2	6	0	7	26
Abdominal wall only	0	0	0	0	0
Upper ext. soft tissue only	0	1	0	0	0
Upper ext. bone & soft tissue	0	1	0	0	0
Lower ext. soft tissue only	1	0	0	2	1
Lower ext. bone & soft tissue	0	3	0	5	0
Unclassified multiple	39	10	3	1	10
TOTAL	60	35	25	27	85

TABLE XVI

INCIDENCE ASSOCIATED WOUNDS AS
RELATED TO PRINCIPAL WOUNDS:
CASES WITH ASSOCIATED MAXILLOFACIAL WOUNDS

ASSOCIATED WOUNDS	Maxillofacial, bone & soft tissue	Maxillofacial, soft tissue only	Eye or orbit assoc. with maxillofacial wound
PRINCIPAL WOUND:			
Intracranial	35	25	11
Intravertebral	1	1	0
Maxillofacial	0	0	5
Cervical	2	4	0
Intrathoracic	5	14	4
Thoraco-abdominal	3	3	2
Combined intra-abdominal & intrathoracic	1	9	5
Intra-abdominal	4	15	2
Abdominal wall only	0	0	0
Upper ext. soft tissue only	0	1	0
Upper ext. bone & soft tissue	0	2	1
Lower ext. soft tissue only	0	3	0
Lower ext. bone & soft tissue	1	10	3
Unclassified multiple	13	27	12
TOTAL	65	114	45

TABLE XVII

INCIDENCE ASSOCIATED WOUNDS AS
RELATED TO PRINCIPAL WOUNDS:
CASES WITH ASSOCIATED CERVICAL WOUNDS

ASSOCIATED WOUNDS	Neck, general	Neck with carotid artery	Neck, with larynx or trachea
PRINCIPAL WOUND:			
Intracranial	17	0	2
Intravertebral	21	0	1
Maxillofacial	3	0	0
Cervical	0	0	1
Intrathoracic	14	1	0
Thoraco-abdominal	12	0	1
Combined intra-abdominal & intra-thoracic	0	0	2
Intra-abdominal	9	0	0
Abdominal wall only	0	0	0
Upper ext. soft tissue only	0	0	0
Upper ext. bone & soft tissue	0	0	0
Lower ext. soft tissue only	1	0	0
Lower ext. bone & soft tissue	4	0	0
Unclassified multiple	23	1	2
TOTAL	104	2	9

TABLE XVIII

INCIDENCE ASSOCIATED WOUNDS AS
RELATED TO PRINCIPAL WOUNDS:
CASES WITH ASSOCIATED THORACIC WOUNDS

ASSOCIATED WOUNDS	Chest wall only	Intra- thoracic, evident	Intra- thoracic, suspected	Combined intra- abdominal & intrathoracic	Thoraco- abdominal
PRINCIPAL WOUND:					
Intracranial	11	24	14	2	1
Intravertebral	4	7	3	0	0
Maxillofacial	1	0	0	0	0
Cervical	1	8	3	1	0
Intrathoracic	0	0	0	0	1
Thoraco-abdominal	0	14	0	0	0
Combined intra-abdomi- nal & intrathoracic	1	1	0	0	0
Intra-abdominal	41	6	17	0	1
Abdominal wall only	1	0	0	0	0
Upper ext. soft tissue only	1	0	3	0	0
Upper ext. bone & soft tissue	1	0	1	0	0
Lower ext. soft tissue only	1	0	0	0	0
Lower ext. bone & soft tissue	8	2	2	1	0
Unclassified multiple	15	32	18	4	2
TOTAL	86	94	61	8	5

TABLE XIX

INCIDENCE ASSOCIATED WOUNDS AS
RELATED TO PRINCIPAL WOUNDS:
CASES WITH ASSOCIATED ABDOMINAL WOUNDS

ASSOCIATED WOUNDS	Abdominal wall only	Intra- abdominal, known	Intra- abdominal, suspected
<hr/>			
PRINCIPAL WOUND			
Intracranial	11	5	0
Intravertebral	1	0	0
Maxillofacial	0	0	1
Cervical	0	0	0
Intrathoracic	8	1	4
Thoraco-abdominal	0	0	0
Combined intra-abdominal & intrathoracic	0	0	0
Intra-abdominal	0	0	0
Abdominal wall only	0	0	0
Upper ext. soft tissue only	1	0	1
Upper ext. bone & soft tissue	3	0	0
Lower ext. soft tissue only	6	0	0
Lower ext. bone & soft tissue	15	2	2
Unclassified multiple	19	12	22
	<hr/>		
TOTAL	64	20	30

TABLE XX

INCIDENCE ASSOCIATED WOUNDS AS
 RELATED TO PRINCIPAL WOUNDS:
 CASES WITH ASSOCIATED UPPER EXTREMITY WOUNDS WITHOUT INVOLVEMENT OF BONE

ASSOCIATED WOUNDS:	Soft tissue only	Soft tissue & artery	Soft tissue & artery & nerve	Soft tissue & nerve
<hr/>				
PRINCIPAL WOUND:				
Intracranial	52	1	1	0
Intravertebral	6	0	0	0
Maxillofacial	3	0	0	0
Cervical	4	0	0	0
Intrathoracic	28	1	0	1
Thoraco-abdominal	29	1	1	1
Combined intra-abdominal & intrathoracic	14	0	0	0
Intra-abdominal	63	2	0	1
Abdominal wall only	2	0	0	0
Upper ext. soft tissue only	0	0	0	0
Upper ext. bone & soft tissue	0	0	0	0
Lower ext. soft tissue only	6	0	0	0
Lower ext. bone & soft tissue	17	0	0	0
Unclassified multiple	32	0	0	0
TOTAL	256	5	2	3

TABLE XXI

INCIDENCE ASSOCIATED WOUNDS AS
RELATED TO PRINCIPAL WOUNDS:
CASES WITH ASSOCIATED UPPER EXTREMITY WOUNDS WITH BONE INVOLVED

ASSOCIATED WOUNDS:	Soft tissue & bone	Soft tissue & artery & bone	Soft tissue & bone & nerve & artery	Soft tissue & bone & nerve	Trau- matic ampu- tation
<hr/>					
PRINCIPAL WOUND:					
Intracranial	24	1	0	1	1
Intravertebral	4	0	0	0	0
Maxillofacial	0	0	0	0	0
Cervical	4	0	1	0	0
Intrathoracic	33	0	0	1	0
Thoraco-abdominal	31	1	0	1	2
Combined intra-abdominal & intrathoracic	11	4	0	1	1
Intra-abdominal	34	3	0	1	0
Abdominal wall only	0	0	0	0	0
Upper ext. soft tissue only	0	0	0	0	0
Upper ext. bone & soft tissue	0	0	0	0	0
Lower ext. soft tissue only	3	0	0	0	1
Lower ext. bone & soft tissue	18	0	0	2	2
Unclassified multiple	27	2	0	1	10
TOTAL	189	11	1	8	17

TABLE XXII

INCIDENCE ASSOCIATED WOUNDS AS
 RELATED TO PRINCIPAL WOUNDS:
 CASES WITH ASSOCIATED LOWER EXTREMITY WOUNDS WITHOUT INVOLVEMENT OF BONE

ASSOCIATED WOUNDS:	Soft tissue only	Soft tissue & artery	Soft tissue & artery & nerve	Soft tissue & nerve
<hr/>				
PRINCIPAL WOUND:				
Intracranial	37	1	0	0
Intravertebral	3	0	0	0
Maxillofacial	1	0	0	0
Cervical	3	0	0	0
Intrathoracic	26	0	0	0
Thoraco-abdominal	43	0	0	0
Combined intra-abdominal & intrathoracic	25	1	0	2
Intra-abdominal	135	6	0	2
Abdominal wall only	1	0	0	0
Upper ext. soft tissue only	1	0	0	0
Upper ext. bone & soft tissue	2	0	0	0
Lower ext. soft tissue only	0	0	0	1
Lower ext. bone & soft tissue	0	1	0	0
Unclassified multiple	39	3	0	0
TOTAL	316	12	0	5

TABLE XXIII

INCIDENCE ASSOCIATED WOUNDS AS
RELATED TO PRINCIPAL WOUNDS
CASES WITH ASSOCIATED LOWER EXTREMITY WOUNDS WITH BONE INVOLVED

ASSOCIATED WOUNDS:	Soft tissue & bone	Soft tissue & artery & bone	Soft tissue & artery & nerve & bone	Soft tissue & bone & nerve	Trau- matic ampu- tation
<hr/>					
PRINCIPAL WOUND:					
Intracranial	21	2	0	0	1
Intravertebral	0	0	0	0	0
Maxillofacial	0	0	0	0	0
Cervical	0	0	0	0	0
Intrathoracic	11	3	0	0	0
Thoraco-abdominal	13	3	0	0	1
Combined intra-abdominal & intrathoracic	9	0	1	0	2
Intra-abdominal	55	2	0	3	5
Abdominal wall only	0	0	0	0	0
Upper ext. soft tissue only	1	0	0	0	0
Upper ext. bone & soft tissue	3	0	0	0	0
Lower ext. soft tissue only	3	0	0	0	1
Lower ext. bone & soft tissue	1	0	0	2	2
Unclassified multiple	28	3	1	1	10
TOTAL	145	13	2	6	22

TABLE XXIV

INCIDENCE OF ARTERIES INJURED (1)
(Excluding Traumatic Amputations)

ARTERIES INJURED	Axillary	Brachial	Femoral	Popliteal	Radial or ulnar	Tibial or peroneal
PRINCIPAL WOUND:						
Intracranial	0	3	1	0	0	1
Intravertebral	0	0	0	0	0	0
Maxillofacial	0	0	0	0	0	0
Cervical	0	0	0	0	1	0
Intrathoracic	1	1	1	0	0	2
Thoraco-abdominal	0	2	0	1	0	2
Combined intra-abdominal & intrathoracic	0	2	0	0	2	2
Intra-abdominal	1	4	7	0	0	1
Abdominal wall only	0	0	0	0	0	0
Upper ext. soft tissue only	1	0	0	0	0	0
Upper ext. bone & soft tissue	1	0	0	0	0	0
Lower ext. soft tissue only	0	0	9	0	0	3
Lower ext. bone & soft tissue	0	0	6	5	0	8
Unclassified multiple	0	1	4	2	1	1
TOTAL	4	13	28	8	4	20

Continued next page

TABLE XXIV Cont'd.

INCIDENCE OF ARTERIES INJURED (2)
(Excluding Traumatic Amputations)

ARTERIES INJURED	Intra- abdominal	Intra- cranial*	Intra- thoracic	Multiple	Others	Sub- clavian
PRINCIPAL WOUND:						
Intracranial	1	28	0	2	0	0
Intravertebral	0	0	0	0	0	0
Maxillofacial	0	0	0	0	0	0
Cervical	0	0	0	0	3	3
Intrathoracic	0	0	7	0	0	0
Thoraco-abdominal	4	0	1	1	0	0
Combined intra-abdominal & intrathoracic	1	0	0	0	0	0
Intra-abdominal	26	0	0	1	0	0
Abdominal wall only	0	0	0	0	0	0
Upper ext. soft tissue only	0	0	0	0	0	0
Upper ext. bone & soft tissue	0	0	0	0	0	0
Lower ext. soft tissue only	0	0	0	0	1	0
Lower ext. bone & soft tissue	0	0	0	1	0	0
Unclassified multiple	0	2	1	0	0	0
TOTAL	32	30	9	5	4	3

(*) Artery or venous sinus.

TABLE XXV
INCIDENCE OF NERVES INJURED (1)
(Excluding Traumatic Amputations)

NERVES INJURED	Brachial plexus	Median	Radial	Ulnar	Other nerve*	Other plexus
PRINCIPAL WOUND:						
Intracranial	0	0	1	1	0	0
Intravertebral	2	0	0	0	0	0
Maxillofacial	0	0	0	0	0	0
Cervical	3	1	1	0	2	0
Intrathoracic	2	0	0	1	0	0
Thoraco-abdominal	0	1	0	1	0	1
Combined intra-abdominal & intrathoracic	0	0	2	0	0	0
Intra-abdominal	0	1	2	0	1	1
Abdominal wall only	0	0	0	0	0	0
Upper ext. soft tissue only	0	0	0	0	0	0
Upper ext. bone & soft tissue	0	0	1	1	0	0
Lower ext. soft tissue only	0	0	0	0	0	0
Lower ext. bone & soft tissue	0	1	0	3	0	0
Unclassified multiple	1	0	0	1	1	0
TOTAL	8	4	7	8	4	2

(*) Extracranial or extravertebral

Continued next page

TABLE XXV Cont'd

INCIDENCE OF NERVES INJURED (2)
(Excluding Traumatic Amputations)

NERVES INJURED Femoral Multiple Peroneal Sciatic Tibial Unclassified

PRINCIPAL WOUND:

Intracranial	0	0	0	0	0	0
Intravertebral	0	0	0	0	0	0
Maxillofacial	0	0	0	0	0	0
Cervical	0	2	0	0	0	0
Intrathoracic	0	0	0	0	0	0
Thoraco-abdominal	0	0	0	0	1	0
Combined intra-abdominal & intrathoracic	0	1	1	2	1	0
Intra-abdominal	0	0	0	6	0	0
Abdominal wall only	0	0	0	0	0	0
Upper ext. soft tissue only	0	0	0	0	0	1
Upper ext. bone & soft tissue	0	0	0	0	0	0
Lower ext. soft tissue only	2	0	0	0	1	0
Lower ext. bone & soft tissue	0	2	1	1	2	0
Unclassified multiple	0	1	0	1	1	0
TOTAL	2	6	2	10	6	1

SECTION II

SURGERY, ANESTHESIA,
REPLACEMENT THERAPY, CHEMOTHERAPY, OXYGEN THERAPY
AND
MISCELLANEOUS DATA & OBSERVATIONS

The tables in this section are largely self explanatory. Primary operations, debridements, subsidiary operations, operating time, secondary operations, and anesthesia for primary and secondary surgery are presented in the order named.

Table XXXIII presents the recorded information relative to oxygen therapy. There was no record of oxygen therapy in 886 of the 1450 deaths. It is most probable that oxygen was given at times without making an entry on the patient's record. It is known, however, that oxygen therapy was indicated at times when it was not given. The cases listed in the column devoted to oxygen therapy during operation are, with few exceptions, those to which oxygen was administered as a part of the anesthetic mixture.

Table XLVII shows that 945 of the deaths studied occurred in evacuation hospitals, and 505 in field hospitals. In the group of 65 cases that were seen in a field hospital and transferred to an evacuation hospital for surgery, those with intracranial wounds (32 cases) head the list. The policy of transferring nearly all with intracranial wounds to an evacuation hospital for surgery accounts for this figure, and it is fair to assume that few if any of these would have survived had they been held in the field hospitals. The same is not true of the 10 cases with unclassified multiple wounds, and the 8 cases with intrathoracic wounds in this group. Many of these might have survived had they been held for surgery in the field hospital. These two principal wound groups are the ones in which the transportability of the battle casualty is most apt to be

overestimated.

Table XLVIII on post-mortem examinations, shows that there were 675 cases in which there was no record of autopsy. It is known that a number of autopsies were done that were not reported. However, many more should have been done and in many instances would have been done, had the pressure of work with living battle casualties not been so great. It was demonstrated time and again that every surgeon should do or witness the post-mortem examination on all of his patients that die. His judgment and ability in the problems of war surgery particularly, develop much more rapidly and to a far greater degree when this is done routinely. Microscopic examinations of tissues from all the important organs is likewise most valuable. Excellent reports from the Second Medical Laboratory and the 15th General Medical Laboratory constitute a part of the record of many of the deaths studied. The high incidence of fat embolism was not appreciated until Lt. Col. Tracy B. Mallory advised us of its incidence in the microscopic sections of tissues from battle casualty deaths. Microscopic examination of tissues in those dying with pigment nephropathies has been quite valuable. Gross and microscopic autopsy studies should be required on all battle casualty deaths. Their educational by-products contribute to the effectiveness of an army.

TABLE XXVI

PRIMARY OPERATIONS AS RELATED
TO PRINCIPAL WOUNDS (1)

PRIMARY OPERATIONS	Amputation	Craniotomy	Debride- ment only	Laminec- tomy	Other operations
PRINCIPAL WOUND:					
Intracranial	3	101	20	0	2
Intravertebral	0	0	5	12	0
Maxillofacial	0	0	5	0	2
Cervical	0	1	11	0	6
Intrathoracic	2	1	40	4	1
Thoraco-abdominal	5	0	6	0	0
Combined intra-abdominal & intrathoracic	8	0	1	1	1
Intra-abdominal	11	0	5	3	0
Abdominal wall only	0	0	1	0	0
Upper ext. soft tissue only	0	0	0	0	0
Upper ext. bone & soft tissue	2	0	5	0	0
Lower ext. soft tissue only	5	0	16	0	0
Lower ext. bone & soft tissue	40	0	36	0	1
Unclassified multiple	8	5	25	3	2
TOTAL	84	108	176	23	15

Continued next page

TABLE XXVI Cont'd

PRIMARY OPERATIONS AS RELATED
TO PRINCIPAL WOUNDS (2)

PRIMARY OPERATIONS	Laparotomy	Thoraco- laparotomy	Thoracotomy	Abdominal stab with- out laparo- tomy
<hr/>				
PRINCIPAL WOUND:				
Intracranial	5	0	0	0
Intravertebral	0	0	0	0
Maxillofacial	0	0	0	0
Cervical	0	0	0	0
Intrathoracic	2	0	33	0
Thoraco-abdominal	100	12	109	18
Combined intra-abdominal & intra-thoracic	42	0	7	0
Intra-abdominal	327	1	0	0
Abdominal wall only	2	0	0	0
Upper ext. soft tissue only	0	0	0	0
Upper ext. bone & soft tissue	0	0	0	0
Lower ext. soft tissue only	2	0	0	0
Lower ext. bone & soft tissue	1	0	0	0
Unclassified multiple	8	1	2	1
<hr/>				
TOTAL	489	14	151	19

TABLE XXVII

DEBRIDEMENT OF OTHER WOUNDS ASSOCIATED WITH
PRIMARY OPERATION FOR THE PRINCIPAL WOUND *

DEBRIDEMENT	All wounds	Omitted deliberately	No statement regarding	Partial
PRINCIPAL WOUND:				
Intracranial	84	3	12	10
Intravertebral	9	0	3	0
Maxillofacial	0	2	0	0
Cervical	1	5	1	0
Intrathoracic	27	2	7	5
Thoraco-abdominal	113	3	44	19
Combined intra-abdominal & intrathoracic	39	2	2	3
Intra-abdominal	204	14	92	22
Abdominal wall only	2	0	0	0
Upper ext. soft tissue only	0	0	0	0
Upper ext. bone & soft tissue	1	1	0	0
Lower ext. soft tissue only	7	0	0	0
Lower ext. bone & soft tissue	23	9	8	2
Unclassified multiple	16	5	3	3
TOTAL	526	46	172	64

(*) Not including those cases in which debridement was the primary (i.e., chief operation.

TABLE XXVIII

SUBSIDIARY OPERATIONS AT THE TIME OF THE PRIMARY
OPERATION AS RELATED TO PRINCIPAL WOUNDS (1)

SUBSIDIARY OPERATIONS	Orchid- ectomy	Other operation	Repair of artery	Symph- ectomy	Trache- otomy	Vitallium cuff used in artery
PRINCIPAL WOUND:						
Intracranial	0	0	0	0	1	0
Intravertebral	0	6	0	0	0	0
Maxillofacial	0	0	0	0	2	0
Cervical	0	1	1	0	3	1
Intrathoracic	0	5	0	0	1	0
Thoraco-abdominal	0	8	0	0	0	0
Combined intra-abdominal & intrathoracic	0	4	0	0	1	0
Intra-abdominal	2	21	1	1	1	0
Abdominal wall only	0	1	0	0	0	0
Upper ext. soft tissue only	0	0	0	0	0	0
Upper ext. bone & soft tissue	0	0	0	0	0	0
Lower ext. soft tissue only	0	0	0	0	0	0
Lower ext. bone & soft tissue	1	2	1	1	0	0
Unclassified multiple	2	1	0	1	3	0
TOTAL	5	49	3	3	12	1

Continued next page

TABLE XXVIII Cont'd

SUBSIDIARY OPERATIONS AT THE TIME OF THE PRIMARY
OPERATION AS RELATED TO PRINCIPAL WOUNDS (2)

SUBSIDIARY OPERATIONS	Bronchos- copy	Cast or plaster splint	Enuclea- tion	Inter- costal nerve block	Ligation of artery	Maxillo- facial repair
PRINCIPAL WOUND:						
Intracranial	1	12	5	1	10	9
Intravertebral	0	5	0	0	0	1
Maxillofacial	0	0	1	0	0	4
Cervical	1	1	0	0	8	1
Intrathoracic	12	12	0	7	3	5
Thoraco-abdominal	18	12	1	5	4	1
Combined intra-abdominal & intrathoracic	2	2	0	0	4	0
Intra-abdominal	5	43	0	1	23	5
Abdominal wall only	0	1	0	0	0	0
Upper ext. soft tissue only	0	0	0	0	0	0
Upper ext. bone & soft tissue	1	2	0	0	1	1
Lower ext. soft tissue only	0	8	0	0	10	0
Lower ext. bone & soft tissue	0	51	1	0	8	1
Unclassified multiple	1	16	1	0	6	3
TOTAL	41	171	9	14	77	31

TABLE XXIX

OPERATING TIME FOR PRIMARY SURGERY
AS RELATED TO PRINCIPAL WOUNDS (1)

TIME IN MINUTES	Less than 30	30- 59	60- 89	90- 119	120- 149	150- 179
<hr/>						
PRINCIPAL WOUND:						
Intracranial	2	3	8	7	8	5
Intravertebral	1	0	0	0	2	0
Maxillofacial	0	0	0	0	1	1
Cervical	1	0	0	1	1	0
Intrathoracic	0	4	2	2	4	3
Thoraco-abdominal	1	2	8	6	11	8
Combined intra-abdominal & intrathoracic	0	0	1	0	1	2
Intra-abdominal	4	4	6	9	16	17
Abdominal wall only	0	0	0	0	0	0
Upper ext. soft tissue only	0	0	0	0	0	0
Upper ext. bone & soft tissue	0	0	0	1	0	0
Lower ext. soft tissue only	0	1	0	3	0	0
Lower ext. bone & soft tissue	0	4	6	3	2	2
Unclassified multiple	2	1	2	4	2	3
TOTAL	11	19	33	36	48	41

Continued next page

TABLE XXIX Cont'd

OPERATING TIME FOR PRIMARY SURGERY
AS RELATED TO PRINCIPAL WOUNDS (2)

TIME IN MINUTES	180- 209	210- 239	240- 299	300- 360	More than 360	No record
<hr/>						
PRINCIPAL WOUND:						
Intracranial	5	0	1	1	2	87
Intravertebral	0	0	0	0	0	15
Maxillofacial	1	0	0	0	0	4
Cervical	0	0	2	0	0	13
Intrathoracic	0	1	0	1	1	63
Thoraco-abdominal	5	4	3	5	1	131
Combined intra-abdominal & intrathoracic	4	1	1	1	0	36
Intra-abdominal	19	8	6	1	0	247
Abdominal wall only	0	0	0	0	0	3
Upper ext. soft tissue only	0	0	0	0	0	0
Upper ext. bone & soft tissue	0	0	0	0	0	6
Lower ext. soft tissue only	0	0	0	0	0	18
Lower ext. bone & soft tissue	2	0	0	0	0	59
Unclassified multiple	1	0	0	2	0	35
TOTAL	37	14	13	11	4	717

TABLE XXX

SECONDARY (LATER) OPERATIONS
AS RELATED TO PRINCIPAL WOUNDS (1)

SECONDARY (LATER) OPERATIONS	Abdominal stab without laparotomy	Ampu- tation	Broncho- scopy	Cast or plaster splint	Crani- otomy	Cystos- tomy
PRINCIPAL WOUND:						
Intracranial	0	1	2	2	16	0
Intravertebral	0	0	1	1	0	2
Maxillofacial	0	0	0	0	0	0
Cervical	0	0	0	0	0	0
Intrathoracic	0	1	1	3	1	1
Thoraco-abdominal	1	1	3	0	1	0
Combined intra-abdominal & intrathoracic	0	0	0	0	0	0
Intra-abdominal	0	4	2	0	0	3
Abdominal wall only	0	0	0	0	0	0
Upper ext. soft tissue only	0	0	0	0	0	0
Upper ext. bone & soft tissue	0	0	0	0	0	0
Lower ext. soft tissue only	0	2	0	0	0	0
Lower ext. bone & soft tissue	0	6	0	0	0	1
Unclassified multiple	0	0	0	0	3	0
TOTAL	1	15	9	6	21	7

Continued next page

TABLE XXX. Cont'd

SECONDARY (LATER) OPERATIONS
AS RELATED TO PRINCIPAL WOUNDS (2)

SECONDARY (LATER) OPERATIONS	Debride- ment	Died during secondary surgery	Drainage tube to pleural sac in- serted	Dressing*	Fasci- otomy	Incision of abscess
PRINCIPAL WOUND						
Intracranial	7	1	1	0	0	2
Intravertebral	1	0	0	0	0	0
Maxillofacial	0	0	0	0	0	0
Cervical	1	1	0	0	0	0
Intrathoracic	2	0	4	0	0	0
Thoraco-abdominal	5	0	5	0	0	1
Combined intra-abdominal & intrathoracic	0	0	1	0	0	0
Intra-abdominal	7	0	0	0	0	0
Abdominal wall only	0	0	0	0	0	0
Upper ext. soft tissue only	0	0	0	0	0	0
Upper ext. bone & soft tissue	1	0	0	1	0	0
Lower ext. soft tissue only	3	0	0	1	1	0
Lower ext. bone & soft tissue	3	0	0	3	0	0
Unclassified multiple	2	2	0	0	0	1
TOTAL	32	4	11	5	1	4

(*) Recorded only when done under anesthesia.

Continued next page

TABLE XXX. Cont'd

SECONDARY (LATER) OPERATIONS
AS RELATED TO PRINCIPAL WOUNDS (3)

SECONDARY (LATER) OPERATIONS	Lamin- ectomy	Lapar- otomy	Opening of colostomy*	Other opera- tions	Removal of foreign body	Renal decapsu- lation
PRINCIPAL WOUND:						
Intracranial	0	1	0	3	0	0
Intravertebral	0	0	0	0	0	0
Maxillofacial	0	0	0	0	0	0
Cervical	0	0	0	1	0	0
Intrathoracic	1	0	0	0	0	0
Thoraco-abdominal	0	3	0	0	0	0
Combined intra-abdominal & intrathoracic	0	1	0	0	0	1
Intra-abdominal	0	5	2	4	0	1
Abdominal wall only	0	0	0	0	0	0
Upper ext. soft tissue only	0	0	0	0	0	0
Upper ext. bone & soft tissue	0	0	0	0	0	0
Lower ext. soft tissue only	0	0	0	0	0	0
Lower ext. bone & soft tissue	0	2	0	0	0	0
Unclassified multiple	0	1	0	0	0	0
TOTAL	1	13	2	8	0	2

(*) Recorded only when done under anesthesia.

Continued next page

TABLE XXX Cont'd

SECONDARY (LATER) OPERATIONS
AS RELATED TO PRINCIPAL WOUNDS (4)

SECONDARY (LATER) OPERATIONS	Second- dary closure	Sympath- ectomy	Third or more opera- tions	Thoraco- laparo- tomy	Thorac- otomy	Trache- otomy
PRINCIPAL WOUND:						
Intracranial	1	0	6	0	0	0
Intravertebral	0	0	0	0	0	0
Maxillofacial	0	0	0	0	0	0
Cervical	0	0	0	0	0	0
Intrathoracic	0	0	0	0	1	0
Thoraco-abdominal	2	0	4	0	1	0
Combined intra-abdominal & intrathoracic	0	0	0	0	0	0
Intra-abdominal	5	0	3	0	0	0
Abdominal wall only	0	0	0	0	0	0
Upper ext. soft tissue only	0	0	0	0	0	0
Upper ext. soft tissue & bone	0	0	0	0	0	0
Lower ext. soft tissue only	0	0	0	0	0	0
Lower ext. bone & soft tissue	0	0	1	0	0	0
Unclassified multiple	0	0	0	0	0	0
TOTAL	8	0	14	0	2	0

TABLE XXXI

ANESTHESIA FOR PRIMARY SURGERY
AS RELATED TO PRINCIPAL WOUNDS (1)

ANESTHETIC AGENTS AND METHODS	Ether, closed system	Ether, Flagg method	Ether, open drop	Ether, unclas- sified	Endo- tracheal	Nitrous oxide
PRINCIPAL WOUND:						
Intracranial	16	1	5	24	31	8
Intravertebral	2	0	0	5	4	2
Maxillofacial	2	0	1	0	2	2
Cervical	6	0	1	0	2	5
Intrathoracic	31	0	1	20	33	22
Thoraco-abdominal	89	1	5	55	100	77
Combined intra-abdominal & intrathoracic	23	0	1	19	22	20
Intra-abdominal	119	2	25	107	112	96
Abdominal wall only	0	0	0	2	1	0
Upper ext. soft tissue only	0	0	0	0	0	0
Upper ext. bone & soft tissue	1	0	0	1	2	1
Lower ext. soft tissue only	4	0	5	4	0	4
Lower ext. bone & soft tissue	20	0	1	18	6	16
Unclassified multiple	11	0	0	22	16	9
TOTAL	324	4	45	277	331	262

Continued next page

TABLE XXXI Cont'd

ANESTHESIA FOR PRIMARY SURGERY
AS RELATED TO PRINCIPAL WOUNDS (2)

ANESTHETIC AGENTS AND METHODS	Local	No record, or none	Other agent*	Pentothal sodium	Regional	Spinal
PRINCIPAL WOUND:						
Intracranial	42	31	0	33	1	0
Intravertebral	5	5	0	0	0	0
Maxillofacial	1	3	0	1	0	0
Cervical	3	7	0	3	0	0
Intrathoracic	9	18	1	11	0	0
Thoraco-abdominal	3	35	0	3	0	0
Combined intra-abdominal & intrathoracic	1	4	1	3	0	0
Intra-abdominal	0	96	1	8	0	0
Abdominal wall only	0	1	0	1	0	1
Upper ext. soft tissue only	0	0	0	0	0	0
Upper ext. bone & soft tissue	0	2	0	3	0	0
Lower ext. soft tissue only	0	3	0	7	0	1
Lower ext. bone & soft tissue	0	23	0	9	0	1
Unclassified multiple	3	14	0	8	0	0
TOTAL	67	242	3	90	1	3

(*) Including ethyl chloride used for induction.

TABLE XXXII

ANESTHESIA FOR SECONDARY SURGERY
AS RELATED TO PRINCIPAL WOUNDS (1)

ANESTHETIC AGENTS AND METHODS	Ether, closed system	Ether, Flagg method	Ether, open drop	Ether, unclas- sified	Endo- tracheal	Nitrous oxide
PRINCIPAL WOUND:						
Intracranial	1	0	0	2	3	1
Intravertebral	0	0	0	0	0	0
Maxillofacial	0	0	0	0	0	0
Cervical	0	0	0	0	0	0
Intrathoracic	0	0	0	1	0	0
Thoraco-abdominal	2	0	0	0	0	2
Combined intra-abdominal & intrathoracic	1	0	0	0	0	1
Intra-abdominal	2	0	1	5	3	2
Abdominal wall only	0	0	0	0	0	0
Upper ext. soft tissue only	0	0	0	0	0	0
Upper ext. bone & soft tissue	0	0	0	1	0	0
Lower ext. soft tissue only	2	0	1	2	0	2
Lower ext. bone & soft tissue	0	0	0	7	0	0
Unclassified multiple	1	0	0	1	1	1
TOTAL	9	0	2	19	7	9

Continued next page

TABLE XXXII Cont'd

ANESTHESIA FOR SECONDARY SURGERY
AS RELATED TO PRINCIPAL WOUNDS (2)

ANESTHETIC AGENTS AND METHODS	Local	No record, or none	Other agent*	Pentothal sodium	Regional	Spinal
PRINCIPAL WOUND:						
Intracranial	5	10	0	5	0	1
Intravertebral	0	3	0	0	0	0
Maxillofacial	0	0	0	0	0	0
Cervical	0	1	0	1	0	0
Intrathoracic	1	4	0	0	0	0
Thoraco-abdominal	3	8	0	0	0	1
Combined intra-abdominal & intrathoracic	0	1	0	0	0	1
Intra-abdominal	3	13	0	3	0	2
Abdominal wall only	0	0	0	0	0	0
Upper ext. soft tissue only	0	0	0	0	0	0
Upper ext. bone & soft tissue	0	1	0	0	0	0
Lower ext. soft tissue only	0	2	0	1	0	0
Lower ext. bone & soft tissue	1	5	0	2	0	0
Unclassified multiple	3	0	0	1	0	0
TOTAL	16	48	0	13	0	5

(*) Including ethyl chloride used for induction.

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TABLE XXXIII

OXYGEN THERAPY
AS RELATED TO ANATOMICAL SOUND

	Oxygen before opera- tion	Oxygen during opera- tion	Oxygen after opera- tion	No record of oxygen
<hr/>				
FRONTAL BOUND:				
Intracranial	25	21	20	240
Intravertebral	4	2	3	18
Maxillofacial	0	2	0	6
Cervical	8	8	2	13
Intrathoracic	22	35	24	74
Thoraco-abdominal	18	99	39	90
Combined intra-abdominal & intrathoracic	12	24	9	24
Intra-abdominal	26	131	63	227
Abdominal wall only	0	1	1	1
Upper ext. soft tissue only	1	0	0	3
Upper ext. bone & soft tissue	0	1	1	9
Lower ext. soft tissue only	1	5	7	21
Lower ext. bone & soft tissue	6	21	21	72
Unclassified multiple	13	13	4	88
<hr/>				
TOTAL CASES	136	363	194	886

TABLE XXXIV

CHEMOTHERAPY AS RELATED TO PRINCIPAL WOUND

ANTIBACTERIOSTATIC DRUGS* AND SODA USED	Penicillin alone	Sulfon- amide alone	Penicillin and Sulfonamide	Soda given	No soda report- ed	No record of chemotherapy
PRINCIPAL WOUND:						
Intracranial	50	37	23	17	48	187
Intravertebral	8	4	4	2	8	11
Axillofacial	2	1	0	0	1	5
Cervical	5	3	1	0	4	16
Intrathoracic	12	21	19	3	38	86
Thoraco-abdominal	37	58	30	7	85	87
Combined intra-abdominal intrathoracic	13	15	5	4	19	26
Intra-abdominal	47	127	71	10	191	163
Abdominal wall only	0	1	0	0	1	2
Upper ext. soft tissue only	1	0	0	1	0	3
Upper ext. bone & soft tissue	1	5	0	1	4	4
Lower ext. soft tissue only	4	15	3	4	14	11
Lower ext. bone & soft tissue	12	35	14	7	45	53
Unclassified multiple	13	15	9	3	23	77
TOTAL	205	335	179	59	481	731

Excluding sulfanilamide applied to wounds at time of first aid dressing.
Including 26 cases in which soda was given without a sulfonamide as an adjuvant
to blood transfusion therapy.

TABLE XXXV

INTRAVENOUS PLASMA THERAPY BEFORE ADMISSION TO HOSPITAL
AS RELATED TO PRINCIPAL WOUNDS (1)

UNITS OF HUMAN PLASMA: (One unit is 250cc)	0*	1	2	3	4	5
<hr/>						
PRINCIPAL WOUND:						
Intracranial	161	55	40	19	14	2
Intravertebral	10	7	4	4	1	0
Maxillofacial	5	1	2	0	0	0
Cervical	13	3	4	2	1	1
Intrathoracic	57	12	34	13	9	3
Thoraco-abdominal	65	32	40	34	25	8
Combined intra-abdominal & intrathoracic	19	11	10	8	5	3
Intra-abdominal	148	43	96	40	34	21
Abdominal wall only	3	0	0	0	0	0
Upper ext. soft tissue only	4	0	0	0	0	0
Upper ext. bone & soft tissue	4	1	0	1	1	2
Lower ext. soft tissue only	18	2	5	3	1	0
Lower ext. bone & soft tissue	36	13	21	16	12	4
Unclassified, multiple	57	19	15	14	3	2
TOTAL CASES	600	199	271	154	106	46

(*) No record of plasma administration, or none given.

Continued next page

TABLE XXXV Cont'd

INTRAVENOUS PLASMA THERAPY BEFORE ADMISSION TO HOSPITAL
AS RELATED TO PRINCIPAL WOUNDS (2)

UNITS OF HUMAN PLASMA: (One unit is 250cc)	6	7	8	9	10	11 or more
<hr/>						
PRINCIPAL WOUND:						
Intracranial	3	2	1	0	0	0
Intravertebral	0	0	0	1	0	0
Maxillofacial	0	0	0	0	0	0
Cervical	0	0	1	0	0	0
Intrathoracic	6	3	0	1	0	0
Thoraco-abdominal	3	2	2	1	0	0
Combined intra-abdominal & intrathoracic	2	0	0	0	0	1*
Intra-abdominal	15	5	3	1	1	1**
Abdominal wall only	0	0	0	0	0	0
Upper ext. soft tissue only	0	0	0	0	0	0
Upper ext. bone & soft tissue	0	0	0	0	0	1***
Lower ext. soft tissue only	1	0	1	0	0	0
Lower ext. bone & soft tissue	4	4	2	1	1	0
Unclassified, multiple	1	0	3	0	0	0
TOTAL CASES	35	16	13	5	2	3

(*) 12 units

(**) 14 units

(***) 11 units

Page 100

1. The first part of the paper is devoted to a discussion of the general principles of the theory of the structure of the atom.

2. The second part of the paper is devoted to a discussion of the general principles of the theory of the structure of the atom.

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13. The thirteenth part of the paper is devoted to a discussion of the general principles of the theory of the structure of the atom.

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17. The seventeenth part of the paper is devoted to a discussion of the general principles of the theory of the structure of the atom.

18. The eighteenth part of the paper is devoted to a discussion of the general principles of the theory of the structure of the atom.

19. The nineteenth part of the paper is devoted to a discussion of the general principles of the theory of the structure of the atom.

20. The twentieth part of the paper is devoted to a discussion of the general principles of the theory of the structure of the atom.

TABLE XXXVI

INTRAVENOUS PLASMA THERAPY AFTER ADMISSION TO HOSPITAL BEFORE SURGERY
AS RELATED TO PRINCIPAL WOUNDS (1)

UNITS OF HUMAN PLASMA (One unit is 250cc)	0*	1	2	3	4	5
PRINCIPAL WOUNDS:						
Intracranial	155	24	43	15	11	8
Intravertebral	11	3	8	0	1	1
Maxillofacial	5	0	1	1	0	0
Cervical	20	3	0	2	0	0
Intrathoracic	83	13	16	13	7	4
Thoraco-abdominal	138	23	26	13	3	4
Combined intra-abdominal & intrathoracic	34	6	8	3	4	1
Intra-abdominal	248	27	61	33	20	5
Abdominal wall only	2	0	0	1	0	0
Upper ext. soft tissue only	2	1	0	0	0	0
Upper ext. bone & soft tissue	7	1	0	0	0	0
Lower ext. soft tissue only	20	4	3	1	3	0
Lower ext. bone & soft tissue	58	14	11	6	6	6
Unclassified, multiple	58	15	18	5	4	5
TOTAL CASES	871	134	195	93	59	34

(*) No record of plasma administration, or none given.

Continued next page

TABLE XXXVI Cont'd

INTRAVENOUS PLASMA THERAPY AFTER ADMISSION TO HOSPITAL BEFORE SURGERY
AS RELATED TO PRINCIPAL WOUNDS (2)

UNITS OF HUMAN PLASMA (One unit is 250cc)	6	7	8	9	10	11 or more
PRINCIPAL WOUNDS:						
Intracranial	5	1	1	1	1	2*
Intravertebral	2	0	0	0	0	1**
Maxillofacial	0	1	0	0	0	0
Cervical	0	0	0	0	0	0
Intrathoracic	0	1	0	0	1	0
Thoraco-abdominal	1	0	1	1	1	0
Combined intra-abdominal & intrathoracic	3	0	0	0	0	0
Intra-abdominal	6	2	2	2	0	2x
Abdominal wall only	0	0	0	0	0	0
Upper ext. soft tissue only	0	1	0	0	0	0
Upper ext. bone & soft tissue	1	0	0	1	0	0
Lower ext. soft tissue only	0	0	0	0	0	0
Lower ext. bone & soft tissue	4	2	3	1	1	2xxx
Unclassified, multiple	4	0	1	0	1	3xxx
TOTAL CASES	26	6	8	6	5	11

(*) 11 units
17 units

(x) 13 units
13 units
(xx) 12 units
17 units

(xxx) 13 units
14 units

29 units - (Given over period
of 4 days - abd. wound, severed pap-
liteal artery, multiple fractures,
clostridial myositis)

TABLE XXXVII

INTRAVENOUS PLASMA THERAPY DURING SURGERY
AS RELATED TO PRINCIPAL WOUNDS (1)

UNITS OF HUMAN PLASMA (One unit is 250cc)	0*	1	2	3	4	5
<hr/>						
PRINCIPAL WOUND:						
Intracranial	280	8	6	1	1	1
Intravertebral	26	0	0	1	0	0
Maxillofacial	8	0	0	0	0	0
Cervical	22	0	1	0	1	0
Intrathoracic	133	3	1	0	1	0
Thoraco-abdominal	193	4	10	0	1	1
Combined intra-abdominal & intrathoracic	48	4	2	2	0	1
Intra-abdominal	356	8	19	10	6	2
Abdominal wall only	3	0	0	0	0	0
Upper ext. soft tissue only	4	0	0	0	0	0
Upper ext. bone & soft tissue	10	0	0	0	0	0
Lower ext. soft tissue only	22	2	1	2	4	0
Lower ext. bone & soft tissue	96	3	12	1	1	0
Unclassified, multiple	108	4	2	0	0	0
TOTAL CASES	1309	36	54	15	15	5

(*) No record of plasma administration, or none given.

Continued next page

TABLE XXXVII Cont'd

INTRAVENOUS PLASMA THERAPY DURING SURGERY
AS RELATED TO PRINCIPAL WOUNDS (2)

UNITS OF HUMAN PLASMA: (One unit is 250cc)	6	7	8	9	10	11 or more
<hr/>						
PRINCIPAL WOUND:						
Intracranial	0	0	0	0	0	0
Intravertebral	0	0	0	0	0	0
Maxillofacial	0	0	0	0	0	0
Cervical	1	0	0	0	0	0
Intrathoracic	0	0	0	0	0	0
Thoraco-abdominal	1	1	1	0	0	0
Combined intra-abdominal & intrathoracic	1	0	0	0	1	0
Intra-abdominal	1	0	2	1	1	0
Abdominal wall only	0	0	0	0	0	0
Upper ext. soft tissue only	0	0	0	0	0	0
Upper ext. bone & soft tissue	0	0	0	0	0	0
Lower ext. soft tissue, only	0	0	0	0	0	0
Lower ext. bone & soft tissue	0	0	0	1	0	0
Unclassified, multiple	0	0	0	0	0	0
TOTAL CASES	4	1	3	2	2	2

TABLE XXXVIII

INTRAVENOUS PLASMA THERAPY AFTER SURGERY
AS RELATED TO PRINCIPAL WOUNDS (1)

UNITS OF HUMAN PLASMA: (One unit is 250cc)	0*	1	2	3	4	5
<hr/>						
PRINCIPAL WOUND:						
Intracranial	275	7	6	0	1	0
Intravertebral	25	1	1	0	0	0
Maxillofacial	7	0	1	0	0	0
Cervical	23	2	0	0	0	0
Intrathoracic	127	3	6	0	1	0
Thoraco-abdominal	183	11	7	2	3	1
Combined intra-abdominal & intrathoracic	46	3	4	2	1	0
Intra-abdominal	331	16	24	12	12	4
Abdominal wall only	2	0	0	1	0	0
Upper ext. soft tissue only	4	0	0	0	0	0
Upper ext. bone & soft tissue	9	0	1	0	0	0
Lower ext. soft tissue only	23	5	2	0	0	0
Lower ext. bone & soft tissue	93	2	7	4	3	1
Unclassified, multiple	103	2	6	0	1	0
TOTAL CASES	1251	52	65	21	22	6

(*) No record of plasma administration, or none given.

Continued next page

TABLE XXXVIII Cont'd

INTRAVENOUS PLASMA THERAPY AFTER SURGERY
AS RELATED TO PRINCIPAL WOUNDS (2)

UNITS OF HUMAN PLASMA: (One unit is 250cc)	6	7	8	9	10	11 or more
<hr/>						
PRINCIPAL WOUND:						
Intracranial	2	1	3	1	0	0
Intravertebral	0	0	0	0	0	0
Maxillofacial	0	0	0	0	0	0
Cervical	0	0	0	0	0	0
Intrathoracic	0	0	1	0	0	0
Thoraco-abdominal	3	0	1	0	1	0
Combined intra-abdominal & intrathoracic	2	1	0	0	0	0
Intra-abdominal	6	0	0	0	2	1*
Abdominal wall only	0	0	0	0	0	0
Upper ext. soft tissue only	0	0	0	0	0	0
Upper ext. bone & soft tissue	0	0	0	0	0	0
Lower ext. soft tissue only	1	0	0	0	0	0
Lower ext. bone & soft tissue	1	1	1	1	0	0
Unclassified, multiple	0	1	1	0	0	0
TOTAL CASES	15	4	7	2	3	1

(*) 12 units

TABLE XXXIX

BLOOD TRANSFUSION THERAPY BEFORE SURGERY
AS RELATED TO PRINCIPAL WOUND (1)

UNITS OF WHOLE BLOOD: (One unit is 500cc)	0*	1	2	3	4	5
<hr/>						
PRINCIPAL WOUND:						
Intracranial	211	37	27	9	6	2
Intravertebral	14	4	5	2	1	1
Maxillofacial	5	1	1	1	0	0
Cervical	12	4	3	4	1	0
Intrathoracic	66	29	18	8	9	6
Thoraco-abdominal	78	33	39	23	18	6
Combined intra-abdominal & intrathoracic	25	9	9	6	5	1
Intra-abdominal	165	56	65	45	41	14
Abdominal wall only	2	1	0	0	0	0
Upper ext. soft tissue only	3	0	0	1	0	0
Upper ext. bone & soft tissue	7	1	1	0	1	0
Lower ext. soft tissue only	22	1	2	3	2	1
Lower ext. bone & soft tissue	53	16	16	7	10	7
Unclassified, multiple	44	27	15	12	9	3
TOTAL CASES	707	219	201	121	103	41

(*) No record of intravenous administration of blood, or none given.

Continued next page

TABLE XXXIX Cont'd

BLOOD TRANSFUSION THERAPY BEFORE SURGERY
AS RELATED TO PRINCIPAL WOUND (2)

UNITS OF WHOLE BLOOD: (One unit is 500cc)	6	7	8	9	10	11
<hr/>						
PRINCIPAL WOUND:						
Intracranial	3	1	1	0	0	0
Intravertebral	0	0	0	0	0	0
Maxillofacial	0	0	0	0	0	0
Cervical	0	0	0	0	1	0
Intrathoracic	1	0	1	0	0	0
Thoraco-abdominal	8	3	1	3	0	0
Combined intra-abdominal & intrathoracic	2	0	0	1	1	0
Intra-abdominal	11	5	2	1	3	0
Abdominal wall only	0	0	0	0	0	0
Upper ext. soft tissue only	0	0	0	0	0	0
Upper ext. bone & soft tissue	0	0	0	0	0	0
Lower ext. soft tissue only	0	0	0	0	0	0
Lower ext. bone & soft tissue	2	2	1	0	0	0
Unclassified, multiple	2	0	1	0	0	1
TOTAL CASES	29	11	7	5	5	1

THE HISTORY OF THE

REPUBLIC OF THE UNITED STATES OF AMERICA

FROM THE FIRST SETTLEMENTS TO THE PRESENT TIME

BY

JOHN F. JOHNSON

NEW YORK

1877

TABLE XL

BLOOD TRANSFUSION THERAPY DURING SURGERY
AS RELATED TO PRINCIPAL WOUND (1)

UNITS OF WHOLE BLOOD: (One unit is 500cc)	0*	1	2	3	4	5
<hr/>						
PRINCIPAL WOUND:						
Intracranial	243	20	21	8	2	0
Intravertebral	21	2	1	2	0	1
Maxillofacial	8	0	0	0	0	0
Cervical	21	1	2	0	0	0
Intrathoracic	117	9	7	1	3	0
Thoraco-abdominal	132	15	34	16	5	3
Combined intra-abdominal & intrathoracic	34	8	6	5	2	2
Intra-abdominal	257	30	53	29	18	6
Abdominal wall only	3	0	0	0	0	0
Upper ext. soft tissue only	4	0	0	0	0	0
Upper ext. bone & soft tissue	10	0	0	0	0	0
Lower ext. soft tissue only	19	4	3	4	1	0
Lower ext. bone & soft tissue	72	6	22	6	1	2
Unclassified, multiple	96	8	5	0	1	2
<hr/>						
TOTAL CASES	1037	103	154	71	33	16

(*) No record of intravenous administration of blood, or none given.

Continued next page

TABLE XL Cont'd

BLOOD TRANSFUSION THERAPY DURING SURGERY
AS RELATED TO PRINCIPAL WOUND (2)

UNITS OF WHOLE BLOOD: (One unit is 500cc)	6	7	8	9	10	11
<hr/>						
PRINCIPAL WOUND:						
Intracranial	2	0	1	0	0	0
Intravertebral	0	0	0	0	0	0
Maxillofacial	0	0	0	0	0	0
Cervical	0	0	1	0	0	0
Intrathoracic	1	0	0	0	0	0
Thoraco-abdominal	6	0	1	0	0	0
Combined intra-abdominal & intrathoracic	1	1	0	0	0	0
Intra-abdominal	5	3	1	4	1	1
Abdominal wall only	0	0	0	0	0	0
Upper ext. soft tissue only	0	0	0	0	0	0
Upper ext. bone & soft tissue	0	0	0	0	0	0
Lower ext. soft tissue only	0	0	0	0	0	0
Lower ext. bone & soft tissue	3	1	0	0	1	0
Unclassified, multiple	0	2	0	0	0	0
TOTAL CASES	18	7	4	4	2	1

TABLE XLI

BLOOD TRANSFUSION THERAPY AFTER SURGERY
AS RELATED TO PRINCIPAL WOUND (1)

UNITS OF WHOLE BLOOD: (One unit is 500cc)	0*	1	2	3	4	5
<hr/>						
PRINCIPAL WOUND:						
Intracranial	267	11	10	2	4	1
Intravertebral	23	2	2	0	0	0
Maxillofacial	6	1	1	0	0	0
Cervical	20	4	0	1	0	0
Intrathoracic	112	13	5	4	3	1
Thoraco-abdominal	159	26	14	2	2	4
Combined intra-abdominal & intrathoracic	43	5	7	1	3	0
Intra-abdominal	287	48	30	13	10	9
Abdominal wall only	3	0	0	0	0	0
Upper ext. soft tissue only	4	0	0	0	0	0
Upper ext. bone & soft tissue	9	0	1	0	0	0
Lower ext. soft tissue only	23	3	2	0	3	0
Lower ext. bone & soft tissue	80	11	4	5	3	5
Unclassified, multiple	93	10	7	2	2	0
TOTAL CASES	1129	134	83	30	30	20

(*) No record of intravenous administration of blood, or none given.

Continued next page

TABLE XLI Cont'd

BLOOD TRANSFUSION THERAPY AFTER SURGERY
AS RELATED TO PRINCIPAL WOUNDS (2)

UNITS OF WHOLE BLOOD: (One unit is 500cc)	6	7	8	9	10	11	12
<hr/>							
PRINCIPAL WOUND:							
Intracranial	1	0	1	0	0	0	0
Intravertebral	0	0	0	0	0	0	0
Maxillofacial	0	0	0	0	0	0	0
Cervical	0	0	0	0	0	0	0
Intrathoracic	0	0	0	0	0	0	0
Thoraco-abdominal	1	0	2	2	0	0	0
Combined intra-abdominal & intrathoracic	0	0	0	0	0	0	0
Intra-abdominal	4	1	2	2	1	0	1
Abdominal wall only	0	0	0	0	0	0	0
Upper ext. soft tissue only	0	0	0	0	0	0	0
Upper ext. bone & soft tissue	0	0	0	0	0	0	0
Lower ext. soft tissue only	0	0	0	0	0	0	0
Lower ext. bone & soft tissue	2	2	1	0	1	0	0
Unclassified, multiple	0	0	0	0	0	0	0
<hr/>							
TOTAL CASES	8	3	6	4	2	0	1

TABLE XLII

SYSTOLIC BLOOD PRESSURE ON ADMISSION TO HOSPITAL
W. RELATIVE TO PRINCIPAL WOUND (1)

ARTERIAL TENSION IN MM. Hg.	Zero	2-33	40-53	60-63	70-78	80-88
PRINCIPAL WOUND:						
Intracranial	7	0	4	8	6	5
Intravertebral	3	0	2	0	0	2
Maxillofacial	0	0	1	0	0	0
Cervical	2	0	1	0	1	0
Intrathoracic	3	0	2	2	3	7
Thoraco-abdominal	3	1	7	6	5	10
Combined intra-abdominal & intrathoracic	7	0	3	3	0	3
Intra-abdominal	30	1	13	9	8	14
Abdominal wall only	0	0	0	0	0	0
Upper ext. soft tissue only	2	0	1	0	0	0
Upper ext. bone & soft tissue	2	0	0	0	0	0
Lower ext. soft tissue only	1	1	0	0	0	1
Lower ext. bone & soft tissue	8	0	2	4	0	2
Unclassified, multiple	10	0	4	6	0	4
TOTAL CASES	88	3	40	38	23	48

(Continued on next page)

TABLE XLII Cont'd

SYSTOLIC BLOOD PRESSURE ON ADMISSION TO HOSPITAL
AS RELATED TO PRINCIPAL WOUND (2)

ARTERIAL TENSION IN mm. Hg.	90-98	100-118	120-138	140-158	160 or more	No record
PRINCIPLE WOUND:						
Intracranial	7	28	25	21	12	174
Intravertebral	2	4	0	0	0	14
Maxillofacial	0	0	0	0	1	6
Cervical	2	1	4	1	0	13
Intrathoracic	6	5	7	0	0	98
Thoraco-abdominal	2	21	8	3	0	141
Combined intra-abdominal & intrathoracic	3	3	2	0	0	35
Intra-abdominal	11	19	17	1	0	285
Abdominal wall only	0	1	0	0	0	2
Upper ext. soft tissue only	0	0	0	0	0	1
Upper ext. bone & soft tissue	0	0	0	0	0	8
Lower ext. soft tissue only	1	1	2	2	0	22
Lower ext. bone & soft tissue	4	5	2	2	1	84
Unclassified, multiple	1	9	3	1	0	76
TOTAL CASES	39	97	70	31	14	959

TABLE XLIII

LOWEST RECORDED SYSTOLIC BLOOD PRESSURE* FOR CASES IN SHOCK
AS RELATED TO PRINCIPAL WOUND

ARTERIAL TENSION IN mm. Hg	Zero	2-38	40-58	60-78	80-88	90-98
-------------------------------	------	------	-------	-------	-------	-------

PRINCIPAL WOUND:

Intracranial	16	0	5	18	10	10
Intravertebral	3	0	3	1	2	5
Maxillofacial	0	0	1	0	0	0
Cervical	4	0	2	0	1	3
Intrathoracic	13	0	2	7	10	9
Thoraco-abdominal	18	1	10	23	12	5
Combined intra-abdominal & intrathoracic	11	0	5	4	6	1
Intra-abdominal	58	3	19	21	18	16
Abdominal wall only	0	0	0	0	0	0
Upper ext. soft tissue only	2	0	1	0	0	0
Upper ext. bone & soft tissue	3	0	0	0	0	0
Lower ext. soft tissue only	3	1	0	2	1	1
Lower ext. bone & soft tissue	14	1	4	12	3	3
Unclassified, multiple	13	0	5	9	6	5
TOTAL CASES	158	6	57	97	69	58

* Excluding a gradual terminal decline immediately preceding death.

REPORT

ON THE PROGRESS OF THE WORK DURING THE YEAR 1907

By the Hon. the President of the Institution, the Rev. the Vice-Chancellor, and the Council

Presented to the General Assembly at the Anniversary Meeting, 1908

1.	General Administration	1907-1908	1908-1909	1909-1910	1910-1911	1911-1912	1912-1913	1913-1914	1914-1915	1915-1916	1916-1917	1917-1918	1918-1919	1919-1920	1920-1921	1921-1922	1922-1923	1923-1924	1924-1925	1925-1926	1926-1927	1927-1928	1928-1929	1929-1930	1930-1931	1931-1932	1932-1933	1933-1934	1934-1935	1935-1936	1936-1937	1937-1938	1938-1939	1939-1940	1940-1941	1941-1942	1942-1943	1943-1944	1944-1945	1945-1946	1946-1947	1947-1948	1948-1949	1949-1950	1950-1951	1951-1952	1952-1953	1953-1954	1954-1955	1955-1956	1956-1957	1957-1958	1958-1959	1959-1960	1960-1961	1961-1962	1962-1963	1963-1964	1964-1965	1965-1966	1966-1967	1967-1968	1968-1969	1969-1970	1970-1971	1971-1972	1972-1973	1973-1974	1974-1975	1975-1976	1976-1977	1977-1978	1978-1979	1979-1980	1980-1981	1981-1982	1982-1983	1983-1984	1984-1985	1985-1986	1986-1987	1987-1988	1988-1989	1989-1990	1990-1991	1991-1992	1992-1993	1993-1994	1994-1995	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028	2028-2029	2029-2030	2030-2031	2031-2032	2032-2033	2033-2034	2034-2035	2035-2036	2036-2037	2037-2038	2038-2039	2039-2040	2040-2041	2041-2042	2042-2043	2043-2044	2044-2045	2045-2046	2046-2047	2047-2048	2048-2049	2049-2050	2050-2051	2051-2052	2052-2053	2053-2054	2054-2055	2055-2056	2056-2057	2057-2058	2058-2059	2059-2060	2060-2061	2061-2062	2062-2063	2063-2064	2064-2065	2065-2066	2066-2067	2067-2068	2068-2069	2069-2070	2070-2071	2071-2072	2072-2073	2073-2074	2074-2075	2075-2076	2076-2077	2077-2078	2078-2079	2079-2080	2080-2081	2081-2082	2082-2083	2083-2084	2084-2085	2085-2086	2086-2087	2087-2088	2088-2089	2089-2090	2090-2091	2091-2092	2092-2093	2093-2094	2094-2095	2095-2096	2096-2097	2097-2098	2098-2099	2099-2100	2100-2101	2101-2102	2102-2103	2103-2104	2104-2105	2105-2106	2106-2107	2107-2108	2108-2109	2109-2110	2110-2111	2111-2112	2112-2113	2113-2114	2114-2115	2115-2116	2116-2117	2117-2118	2118-2119	2119-2120	2120-2121	2121-2122	2122-2123	2123-2124	2124-2125	2125-2126	2126-2127	2127-2128	2128-2129	2129-2130	2130-2131	2131-2132	2132-2133	2133-2134	2134-2135	2135-2136	2136-2137	2137-2138	2138-2139	2139-2140	2140-2141	2141-2142	2142-2143	2143-2144	2144-2145	2145-2146	2146-2147	2147-2148	2148-2149	2149-2150	2150-2151	2151-2152	2152-2153	2153-2154	2154-2155	2155-2156	2156-2157	2157-2158	2158-2159	2159-2160	2160-2161	2161-2162	2162-2163	2163-2164	2164-2165	2165-2166	2166-2167	2167-2168	2168-2169	2169-2170	2170-2171	2171-2172	2172-2173	2173-2174	2174-2175	2175-2176	2176-2177	2177-2178	2178-2179	2179-2180	2180-2181	2181-2182	2182-2183	2183-2184	2184-2185	2185-2186	2186-2187	2187-2188	2188-2189	2189-2190	2190-2191	2191-2192	2192-2193	2193-2194	2194-2195	2195-2196	2196-2197	2197-2198	2198-2199	2199-2200	2200-2201	2201-2202	2202-2203	2203-2204	2204-2205	2205-2206	2206-2207	2207-2208	2208-2209	2209-2210	2210-2211	2211-2212	2212-2213	2213-2214	2214-2215	2215-2216	2216-2217	2217-2218	2218-2219	2219-2220	2220-2221	2221-2222	2222-2223	2223-2224	2224-2225	2225-2226	2226-2227	2227-2228	2228-2229	2229-2230	2230-2231	2231-2232	2232-2233	2233-2234	2234-2235	2235-2236	2236-2237	2237-2238	2238-2239	2239-2240	2240-2241	2241-2242	2242-2243	2243-2244	2244-2245	2245-2246	2246-2247	2247-2248	2248-2249	2249-2250	2250-2251	2251-2252	2252-2253	2253-2254	2254-2255	2255-2256	2256-2257	2257-2258	2258-2259	2259-2260	2260-2261	2261-2262	2262-2263	2263-2264	2264-2265	2265-2266	2266-2267	2267-2268	2268-2269	2269-2270	2270-2271	2271-2272	2272-2273	2273-2274	2274-2275	2275-2276	2276-2277	2277-2278	2278-2279	2279-2280	2280-2281	2281-2282	2282-2283	2283-2284	2284-2285	2285-2286	2286-2287	2287-2288	2288-2289	2289-2290	2290-2291	2291-2292	2292-2293	2293-2294	2294-2295	2295-2296	2296-2297	2297-2298	2298-2299	2299-2300	2300-2301	2301-2302	2302-2303	2303-2304	2304-2305	2305-2306	2306-2307	2307-2308	2308-2309	2309-2310	2310-2311	2311-2312	2312-2313	2313-2314	2314-2315	2315-2316	2316-2317	2317-2318	2318-2319	2319-2320	2320-2321	2321-2322	2322-2323	2323-2324	2324-2325	2325-2326	2326-2327	2327-2328	2328-2329	2329-2330	2330-2331	2331-2332	2332-2333	2333-2334	2334-2335	2335-2336	2336-2337	2337-2338	2338-2339	2339-2340	2340-2341	2341-2342	2342-2343	2343-2344	2344-2345	2345-2346	2346-2347	2347-2348	2348-2349	2349-2350	2350-2351	2351-2352	2352-2353	2353-2354	2354-2355	2355-2356	2356-2357	2357-2358	2358-2359	2359-2360	2360-2361	2361-2362	2362-2363	2363-2364	2364-2365	2365-2366	2366-2367	2367-2368	2368-2369	2369-2370	2370-2371	2371-2372	2372-2373	2373-2374	2374-2375	2375-2376	2376-2377	2377-2378	2378-2379	2379-2380	2380-2381	2381-2382	2382-2383	2383-2384	2384-2385	2385-2386	2386-2387	2387-2388	2388-2389	2389-2390	2390-2391	2391-2392	2392-2393	2393-2394	2394-2395	2395-2396	2396-2397	2397-2398	2398-2399	2399-2400	2400-2401	2401-2402	2402-2403	2403-2404	2404-2405	2405-2406	2406-2407	2407-2408	2408-2409	2409-2410	2410-2411	2411-2412	2412-2413	2413-2414	2414-2415	2415-2416	2416-2417	2417-2418	2418-2419	2419-2420	2420-2421	2421-2422	2422-2423	2423-2424	2424-2425	2425-2426	2426-2427	2427-2428	2428-2429	2429-2430	2430-2431	2431-2432	2432-2433	2433-2434	2434-2435	2435-2436	2436-2437	2437-2438	2438-2439	2439-2440	2440-2441	2441-2442	2442-2443	2443-2444	2444-2445	2445-2446	2446-2447	2447-2448	2448-2449	2449-2450	2450-2451	2451-2452	2452-2453	2453-2454	2454-2455	2455-2456	2456-2457	2457-2458	2458-2459	2459-2460	2460-2461	2461-2462	2462-2463	2463-2464	2464-2465	2465-2466	2466-2467	2467-2468	2468-2469	2469-2470	2470-2471	2471-2472	2472-2473	2473-2474	2474-2475	2475-2476	2476-2477	2477-2478	2478-2479	2479-2480	2480-2481	2481-2482	2482-2483	2483-2484	2484-2485	2485-2486	2486-2487	2487-2488	2488-2489	2489-2490	2490-2491	2491-2492	2492-2493	2493-2494	2494-2495	2495-2496	2496-2497	2497-2498	2498-2499	2499-2500	2500-2501	2501-2502	2502-2503	2503-2504	2504-2505	2505-2506	2506-2507	2507-2508	2508-2509	2509-2510	2510-2511	2511-2512	2512-2513	2513-2514	2514-2515	2515-2516	2516-2517	2517-2518	2518-2519	2519-2520	2520-2521	2521-2522	2522-2523	2523-2524	2524-2525	2525-2526	2526-2527	2527-2528	2528-2529	2529-2530	2530-2531	2531-2532	2532-2533	2533-2534	2534-2535	2535-2536	2536-2537	2537-2538	2538-2539	2539-2540	2540-2541	2541-2542	2542-2543	2543-2544	2544-2545	2545-2546	2546-2547	2547-2548	2548-2549	2549-2550	2550-2551	2551-2552	2552-2553	2553-2554	2554-2555	2555-2556	2556-2557	2557-2558	2558-2559	2559-2560	2560-2561	2561-2562	2562-2563	2563-2564	2564-2565	2565-2566	2566-2567	2567-2568	2568-2569	2569-2570	2570-2571	2571-2572	2572-2573	2573-2574	2574-2575	2575-2576	2576-2577	2577-2578	2578-2579	2579-2580	2580-2581	2581-2582	2582-2583	2583-2584	2584-2585	2585-2586	2586-2587	2587-2588	2588-2589	2589-2590	2590-2591	2591-2592	2592-2593	2593-2594	2594-2595	2595-2596	2596-2597	2597-2598	2598-2599	2599-2600	2600-2601	2601-2602	2602-2603	2603-2604	2604-2605	2605-2606	2606-2607	2607-2608	2608-2609	2609-2610	2610-2611	2611-2612	2612-2613	2613-2614	2614-2615	2615-2616	2616-2617	2617-2618	2618-2619	2619-2620	2620-2621	2621-2622	2622-2623	2623-2624	2624-2625	2625-2626	2626-2627	2627-2628	2628-2629	2629-2630	2630-2631	2631-2632	2632-2633	2633-2634	2634-2635	2635-2636	2636-2637	2637-2638	2638-2639	2639-2640	2640-2641	2641-2642	2642-2643	2643-2644	2644-2645	2645-2646	2646-2647	2647-2648	2648-2649	2649-2650	2650-2651	2651-2652	2652-2653	2653-2654	2654-2655	2655-2656	2656-2657	2657-2658	2658-2659	2659-2660	2660-2661	2661-2662	2662-2663	2663-2664	2664-2665	2665-2666	2666-2667	2667-2668	2668-2669	2669-2670	2670-2671	2671-2672	2672-2673	2673-2674	2674-2675	2675-2676	2676-2677	2677-2678	2678-2679	2679-2680	2680-2681	2681-2682	2682-2683	2683-2684	2684-2685	2685-2686	2686-2687	2687-2688	2688-2689	2689-2690	2690-2691	2691-2692	2692-2693	2693-2694	2694-2695	2695-2696	2696-2697	2697-2698	2698-2699	2699-2700	2700-2701	2701-2702	2702-2703	2703-2704	2704-2705	2705-2706	2706-2707	2707-2708	2708-2709	2709-2710	2710-2711	2711-2712	2712-2713	2713-2714	2714-2715	2715-2716	2716-2717	2717-2718	2718-2719	2719-2720	2720-2721	2721-2722	2722-2723	2723-2724	2724-2725	2725-2726	2726-2727	2727-2728	2728-2729	2729-2730	2730-2731	2731-2732	2732-2733	2733-2734	2734-2735	2735-2736	2736-2737	2737-2738	2738-2739	2739-2740	2740-2741	2741-2742	2742-2743	2743-2744	2744-2745	2745-2746	2746-2747	2747-2748	2748-2749	2749-2750	2750-2751	2751-2752	2752-2753	2753-2754	2754-2755	2755-2756	2756-2757	2757-2758	2758-2759	2759-2760	2760-2761	2761-2762	2762-2763	2763-2764	2764-2765	2765-2766	2766-2767	2767-2768	2768-2769	2769-2770	2770-2771	2771-2772	2772-2773	2773-2774	2774-2775	27
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TABLE XLIV

NATURE OF EVIDENCE FOR SHOCK IN CASES WITHOUT RECORDED HYPOTENSION
AS RELATED TO PRINCIPAL WOUND

	B.P. 100 or more but pulse rapid & weak*	B.P. 100 or more but shock recorded	Presence of shock suspected recorded by infer- ence	Shock suspected by infer- ence	Therapy suggests shock	No evi- dence of shock
PRINCIPAL WOUND:						
Intracranial	10	0	30	13	63	122
Intravertebral	0	0	3	0	4	6
Mandibulo-facial	0	0	0	1	4	2
Cervical	1	0	3	1	5	5
Intrathoracic	3	0	23	24	40	7
Thoraco-abdominal	5	0	44	17	72	5
Combined intra-abdominal & intrathoracic	0	0	10	1	19	2
Intra-abdominal	8	2	93	45	119	6
Abdominal wall only	0	0	0	0	0	3
Upper ext. soft tissue only	0	0	0	1	0	0
Upper ext. bone & soft tissue	0	0	0	0	4	3
Lower ext. soft tissue only	0	0	10	3	4	6
Lower ext. bone & soft tissue	1	0	26	11	34	5
Unclassified, multiple	1	0	31	17	20	7
TOTAL CASES	29	2	273	124	388	179

*No comment on shock in the case reports.

TABLE XLV

URINARY OUTPUT AS RELATED TO PRINCIPAL WOUND

URINARY EXCRETION	Output adequate	Apparently adequate but record incomplete	Anuria*	Oliguria/ recorded	Oliguria suspected	No record
PRINCIPAL WOUND:						
Intracranial	3	9	2	3	2	278
Intravertebral	0	3	0	1	2	21
Maxillofacial	0	0	0	0	0	8
Cervical	2	1	0	1	0	21
Intrathoracic	5	2	1	2	0	128
Thoraco-abdominal	7	6	5	14	7	173
Combined intra-abdominal & intrathoracic	2	0	0	7	0	50
Intra-abdominal	12	7	13	32	11	333
Abdominal wall only	0	0	0	0	0	3
Upper ext. soft tissue only	0	0	0	1	0	3
Upper ext. bone & soft tissue	1	0	0	0	0	9
Lower ext. soft tissue only	1	1	1	3	1	24
Lower ext. bone & soft tissue	3	3	0	9	0	99
Unclassified multiple	1	1	0	4	2	106
TOTAL CASES	37	33	22	77	25	1256

(*) Less than 100cc per diem.

(/) 100 to 800cc per diem.

TABLE XLVI

MISCELLANEOUS OBSERVATIONS AS RELATED TO PRINCIPAL WOUND

	Burns present	Coma on admission	Exposure, severe, before admission	Hemorrhage, profuse, after admission	Peritoneal closure impossible	Tourniquet used before admission
PRINCIPAL WOUND:						
Cranial	4	167	4	15	0	1
Cervical	0	1	0	0	0	0
Facial	1	1	0	0	0	0
Neck	0	4	0	5	0	1
Thoracic	3	9	1	0	0	1
Thoraco-abdominal	1	2	0	3	4	1
Combined intra-abdominal & intrathoracic	0	3	0	1	1	1
Thoraco-abdominal	3	8	2	29	3	7
Abdominal wall only	0	0	0	0	0	0
Over ext. soft tissue only	0	1	0	0	0	0
Over ext. bone & soft tissue	0	1	0	0	0	.3
Over ext. soft tissue only	1	1	1	1	0	3
Over ext. bone & soft tissue	4	4	1	3	0	1.9
Classified, multiple	11	16	1	1	0	1.5
TOTAL CASES	28	218	10	58	8	4.2

TABLE XLVII

DATA RELATIVE TO DISTRIBUTION OF DEATHS
IN FIELD AND EVACUATION HOSPITALS

TYPE OF HOSPITAL IN WHICH PATIENT DIED	Field Hospital	Evacuation* Hospital	Transfer (1)	Transfer (2)
PRINCIPAL WOUND:				
Intracranial	25	272	4	32
Intravertebral	2	25	0	5
Maxillofacial	0	8	0	1
Cervical	9	16	0	1
Intrathoracic	54	84	3	8
Thoraco-abdominal	113	99	7	2
Combined intra-abdominal & intrathoracic	29	30	1	0
Intra-abdominal	215	193	7	3
Abdominal wall only	1	2	1	0
Upper ext. soft tissue only	1	3	0	0
Upper ext. bone & soft tissue	2	8	1	1
Lower ext. soft tissue only	5	26	2	0
Lower ext. bone & soft tissue	32	82	2	2
Unclassified, multiple	17	97	2	10
TOTAL CASES	505	945	30	65

(*) Including figures in third and fourth columns.

(1) Primary surgery done in field hospital, and patient died in evacuation hospital after transfer.

(2) Patient seen in field hospital and transferred to evacuation hospital for primary surgery.

TABLE XLVIII

POST MORTEM EXAMINATIONS AS RELATED TO PRINCIPAL WOUND

	No autopsy done	Gross reported, but no micro- scopic	Gross reported micro. not re- ported	Gross and micro. reported
PRINCIPAL WOUND:				
Intracranial	141	48	10	98
Intravertebral	13	1	1	12
Maxillofacial	2	3	0	3
Cervical	8	9	1	7
Intrathoracic	69	34	2	33
Thoraco-abdominal	79	76	13	44
Combined intra-abdominal & intra-thoracic	15	22	1	21
Intra-abdominal	193	130	14	71
Abdominal wall only	2	0	0	1
Upper ext. soft tissue only	3	1	0	0
Upper ext. bone & soft tissue	6	2	0	2
Lower ext. soft tissue only	11	5	5	10
Lower ext. bone & soft tissue	60	20	10	24
Unclassified, multiple	73	14	4	23
TOTAL	675	365	61	349
CASES				

SECTION III

CAUSES OF DEATH

Part 1

General Observations

PRELIMINARY REMARKS

Section III deals with causes of death, and is perhaps the most interesting part of the report. More time and thought have been expended in its preparation than in the preparation of any other section. Certain problems were encountered in the classification and arrangement of this material. The Adjutant General of the Fifth Army and the Adjutant General of the United States Army report battle casualty deaths as "killed in action" or "died of wounds" (the latter includes those dying of injuries incurred in action). Hospitals report deaths according to a classification of principal wounds. Generally speaking, all battle casualties who die, are said to die of wounds or injuries incurred in action. All of the cases reported in this study may be said to have died of wounds and/or injuries incurred in action against the enemy. Table LVII on page 96 classifies the cases as to region of primary trauma leading to death. This classification is comparable to those mentioned above. For the purposes of this study, however, such classifications have been deemed inadequate.

A battle casualty who suffers a laceration of the popliteal artery may or may not lose sufficient blood to lead to severe shock, and death. If he does, the primary cause of death according to conventional reports is a wound of the posterior aspect of the knee, with laceration of the popliteal artery. For the purposes of this report, the important desideratum in such a case is that the immediate or precipitating cause of death is shock (peripheral vascular failure).

While fully aware of the controversial nature of the subject, we have elected to include the uncorrected state of shock as an immediate or precipitating cause of death, along with other more specific, standard diagnoses. It may be contended of course, that such patients actually die of their wounds and the severity of the trauma attending them, and that the shock which is present is a syndrome reflecting a profound pathologic alteration of normal hemodynamics and is not an acceptable diagnosis. However, in this study, as stated above, each case has been classified as to primary trauma leading to death (the conventional primary or basic diagnosis), and the liberty of employing the concept of the state of shock as a "diagnosis" for the immediate or precipitating cause of death (the conventional secondary diagnosis) allows for a more complete classification of the causes of death for comparison and study. This sets in relief that important group of cases which succumbed from the gravity of their wounds in a state of uncontrolled shock. It seems that this group of cases is worthy of the special attention afforded by such a classification.

Shock was selected as the immediate cause of death in 523 cases in our series. A special study was made on this group and is presented in Section V. The criteria used in naming shock as an immediate cause of death are discussed there and are apparent in the information tabulated.

"Neural trauma and/or intracranial hemorrhage or clot" was listed as the immediate cause of death in 213 cases and is second on the list of the immediate causes of death in Table XLIX. The relative importance as lethal factors of the brain damage produced by the missile

and the damage produced by an expanding intracranial hematoma was often difficult to determine. It seemed unwise, considering the information available and our qualifications to evaluate it, to attempt to separate these cases into two groups. It may be mentioned here that only 15 cases in whom the principal wound was intracranial were listed as dying of shock, while 210 were listed as dying of neural trauma or clot. (All of the 235 cases in these two categories were listed also under the heading "Primary trauma leading to death, intracranial").

Tables L to LII deal with the twelve leading causes of death. Nephropathies were third on the list, and their incidence was relatively constant except during the first three months of the period covered by this report. The low incidence at that time may be attributed to failure of recognition and is therefore apparent rather than real.

In the first period covered clostridial myositis was the third leading cause of death, the 35 cases comprising 6.5% of all deaths, and 0.28% of hospital battle casualty admissions. In the last period it fell to the bottom of the list, with only one death attributed to it, comprising 0.6% of the deaths studied, and only 0.01% of all battle casualties admitted to hospitals. The educational program concerning clostridial myositis and study of the problem conducted by Major Floyd Jergesen and Lt. Colonel F.A. Simeone, more complete surgery on all wounds, the more liberal use of blood, and the advent of the extensive use of penicillin were important factors in effecting this striking reduction in mortality (and the corresponding reduction in the incidence which is evident in reports to Fifth Army).

Peritonitis tended to show a slight increase in its percentage of the total battle casualty admissions and a more pronounced increase

in its percentage of the deaths studied. There are two factors which may have contributed. First is the reduction in mortality from shock, clostridial myositis, extremity wounds (See Tables LVII & LVIII), and unclassified wounds in the course of the 17 months covered by the study. This has led to a relative increase in peritonitis deaths, deaths from intracranial wounds, and other wounds or complications, the incidence of which is at this time more or less inevitable. The second factor is the increase in the percentage of autopsies performed (See Appendix E), which probably accounts for the apparent but slight increase in the number of peritonitis deaths as compared to hospital battle casualty admissions.

The only striking variation in mortality from pneumonia is in the April-July 1944 period, in which pneumonia deaths comprised only 1.2% of the deaths studied as compared to the average of 3.4% for all four periods. It is the only one of the four periods which did not include winter months.

Attention is directed to the incidence of fat embolism. This diagnosis was not recorded except when microscopic reports indicated large amounts of fat in the pulmonary sections and the record indicated a clinical behaviour justifying the diagnosis. It may be noted (See Table LXX) that the diagnosis of fat embolism was evident in 22 additional cases in which it was listed as contributory condition rather than the immediate cause of death.

Thrombotic embolism, & tracheobronchial obstruction from aspirated vomitus, blood, or mucus, appear quite prominently in the leading causes of death. Their relative incidence showed a definite increase and the actual incidence perhaps a slight increase in spite of recognition of their importance & inauguration of prophylactic measures early in the campaign.

TABLE XLIX

IMMEDIATE CAUSE OF DEATH

SHOCK	523
NEURAL (BRAIN) TRAUMA &/OR INTRACRANIAL HEMORRHAGE OR CLOT	213
PIGMENT NEPHROPATHY	68
PERITONITIS	65
CLOSTRIDIAL MYOSITIS	51
PNEUMONIA	49
FAT EMBOLISM	27
THROMBOTIC EMBOLISM	20
SPINAL CORD TRAUMA	16
TRACHEO-BRONCHIAL OBSTRUCTION, ASPIRATED VOMITUS	11
TRACHEO-BRONCHIAL OBSTRUCTION, BLOOD AND MUCUS	11
CEREBRAL ISCHEMIA	8
ANESTHETIC AGENT	7
EMPHYEMA THORACIS	7
INTRACRANIAL BLAST TRAUMA ALONE	5
CELLULITIS (Extra peritoneal)	4
MYOCARDIAL DECOMPENSATION	4
CORONARY OCCLUSION	3
PULMONARY BLAST TRAUMA ALONE	3
RESPIRATORY OBSTRUCTION ABOVE TRACHEA	3
ABSCESS, INTRA-ABDOMINAL	2

Continued on next page

TABLE XLIX Cont'd

IMMEDIATE CAUSE OF DEATH (Cont)

AIR EMBOLISM	2
INFARCTION OF LUNG	2
INTESTINAL OBSTRUCTION	2
INTRACRANIAL BLAST & OTHER TRAUMA	2
MENINGITIS, INTRACRANIAL	2
PULMONARY BLAST AND OTHER TRAUMA	2
VENTRICULAR ARREST	2
ABSCCESS, INTRACRANIAL	1
INFARCTION, BRAIN & LUNG	1
MEDIASTINIAL HEMORRHAGE	1
MEDIASTINITIS	1
MENINGITIS, SPINAL	1
PNEUMONITIS	1
RESPIRATORY FAILURE, CAUSE UNDETERMINED	1
SEPSIS UNCLASSIFIED, ABDOMINAL	1
SEPSIS UNCLASSIFIED, EXTREMITY	1
SEPTICEMIA	1
THORACO-ABDOMINAL TRAUMA, UNCLASSIFIED	1
TRANSFUSION REACTION	1
OTHER INTRA-ABDOMINAL CONDITION	2
OTHER INTRACRANIAL CONDITION	1
UNDETERMINED THORACIC CONDITION	12

Continued on next page

TABLE KLIK Cont'd

IMMEDIATE CAUSE OF DEATH (Cont)

UNDETERMINED INTRA-ABDOMINAL CONDITION	4
UNDETERMINED ABDOMINAL WALL CONDITION	1
UNDETERMINED INTRACRANIAL CONDITION	1
UNDETERMINED UNCLASSIFIED	<u>303*</u>
TOTAL:	1450

* See Volume Two for analytical data on this group.

TABLE I

THE LEADING CAUSES OF DEATH IN 1450 BATTLE CASUALTY DEATHS,
SHOWING THE NUMBER OF CASES BY PERIOD

	JAN.-MAR. 1944	APR.-JULY 1944	AUG.-DEC 1944	JAN.-MAY 1945	TOTAL
Shock	183	104	91	55	523
Neural trauma &/or intra- cranial hemorrhage or clot	65	66	45	36	212
Nephropathy	9	25	26	8	68
Peritonitis	13	26	19	7	65
Clostridial myositis	35	11	4	1	51
Pneumonia	20	6	17	6	49
Fat embolism	5	0	0	4	27
Thrombotic embolism	5	12	1	2	20
Spinal cord trauma	6	1	6	3	16
Tracheo-bronchial obstruc- tion, aspirated vomitus	3	1	3	4	11
Tracheo-bronchial obstruc- tion, blood & mucus	1	4	3	3	11
Cerebral ischemia	2	1	2	3	8
Others in which immediate cause of death is known	28	25	24	9	86
Remainder in which immediate cause of death is undeter- mined, unclassified	154	101	34	14	303
TOTAL:	529	482	284	155	1450

TABLE LI

THE LEADING CAUSES OF DEATH IN 1450 BATTLE CASUALTY DEATHS,
SHOWING PERCENTAGE DISTRIBUTION BY PERIOD.

	JAN-MAR 1944	APR-JULY 1944	AUG-DEC 1944	JAN-MAY 1945	JAN-44 thru MAY-45
Total Cases	529	482	284	155	1450
Shock	34.6%	40.3%	32.0%	35.5%	36.1%
Neural Trauma &/or Intra- cranial Hemorrhage or Clot	12.3	13.7	15.8	23.2	14.7
Nephropathy	1.7	5.2	9.2	5.2	4.7
Peritonitis	2.5	5.4	6.7	4.5	4.5
Clostridial Myositis	6.5	2.3	1.4	0.6	3.5
Pneumonia	2.6	1.2	6.0	3.9	3.4
Fat Embolism	0.9	1.9	3.2	2.6	1.9
Thrombotic Embolism	0.9	2.5	0.4	1.3	1.4
Spinal Cord Trauma	1.1	0.2	2.1	1.9	1.1
Tracheo-bronchial Obstruction, Aspirated Vomitus	0.6	0.2	1.1	2.6	0.8
Tracheo-bronchial Obstruction, Blood & Mucus	0.2	0.8	1.1	1.9	0.8
Cerebral Vasculitis	0.4	0.2	0.7	1.9	0.6
TOTAL	64.3%	73.0%	70.7%	85.1%	73.5%

TABLE III

THE LEADING CAUSES OF DEATH IN 1450 BATTLE CASUALTY DEATHS,
SHOWING THE PERCENTAGE OF THE TOTAL BATTLE CASUALTY
ADMISSIONS* BY PERIODS

	JAN-MAR 1944	APR-JUL 1944	AUG-DEC 1944	JAN-MAY 1945	JAN.44 thru MAY.45
Shock	1.38%	.08%	0.676%	0.750%	.960%
Neural Trauma &/or Intra- cranial Hemorrhage or Clot	.49	.35	0.334	0.490	0.390
Peritonitis	0.068	.126	0.193	0.110	.125
Clostridial Myositis	0.280	0.055	0.030	0.010	0.094
Pneumonia	0.160	0.030	0.126	0.080	0.090
Fat Embolism	0.040	0.040	0.067	0.050	0.050
Thrombotic Embolism	0.040	0.060	0.010	0.030	0.040
Spinal Cord Trauma	0.050	0.005	0.050	0.040	0.030
Tracheo-bronchial Obstruction, Aspirated Vomitus	0.020	0.005	0.020	0.050	0.020
Tracheo-bronchial Obstruction, Blood & Mucus	0.010	0.020	0.020	0.040	0.020
Cerebral Ischemia	0.020	0.005	0.015	0.040	0.015

*Corrected to allow for the percentage of hospital battle casualty deaths
not studied in each period. See Appendix.

TABLE LIII

REGION OF IMMEDIATE CAUSE OF DEATH
NUMBER OF CASES BY PERIOD

	JAN-MAR 1944	APR-JUL 1944	AUG-DEC 1944	JAN-MAY 1945	TOTAL
Shock *	183	102	93	55	523
Intracranial	73	71	48	42	234
Thoracic	45	45	47	21	158
Abdominopelvic	30	59	47	18	154
Extremity	32	8	3	2	45
Spinal	6	1	9	3	19
Miscellaneous (general) *	5	3	3	0	11
Cervical	1	1	0	0	2
Maxillofacial	0	1	0	0	1
Undetermined, unclassified	154	101	34	14	303
TOTAL	529	482	284	155	1450

*Generalized conditions involving more than one region

TABLE LIV
REGION OF IMMEDIATE CAUSE OF DEATH
PERCENTAGE DISTRIBUTION BY PERIOD

	JAN-MAR 1944	APR-JUL 1944	AUG-DEC 1944	JAN-MAY 1945	TOTAL
Shock*	34.6	30.9	32.7	35.5	36.1
Intracranial	13.7	14.7	16.9	27.1	16.1
Thoracic	8.4	9.4	16.5	13.6	11.9
Abdominopelvic	5.6	12.3	16.5	11.6	10.6
Extremity	6.0	1.7	1.1	1.3	3.1
Spinal	1.1	0.2	3.2	1.9	1.3
Miscellaneous (general)*	0.9	0.4	0.1	0.0	0.8
Cervical	0.6	0.2	0.0	0.0	0.1
Maxillofacial	0.0	0.2	0.0	0.0	0.1
Undetermined, unclassified	29.1	21.0	12.0	9.0	20.9
TOTAL	100%	100%	100%	100%	100%

* Generalized conditions involving more than one region.

TABLE LV.
REGION OF PRINCIPAL WOUND COMPARED
WITH REGION OF IMMEDIATE CAUSE OF DEATH

	Region of principal wound	Percentage of cases studied	Regions of of cause death	Perce- tage of cases studied
Abdominal	543	37.5%	154	10.6%
Intracranial	297	20.5	234	16.1
Thoracic	277	19.1	158	10.0
Extremity	159	11.0	45	3.1
Intravertebral	27	1.8	19	1.3
Cervical	25	1.7	2	0.1
Maxillofacial	8	0.5	1	0.1
Unclassified	114 *	7.9	303 †	20.9
General ^x			11	0.8
Shock			523	36.1
TOTAL	1450 Cases	100%	1450 Cases	100%

* Multiple wounds.

† Cause of death undetermined.

x More than one region involved by cause of death, excluding shock.

TABLE LVI

REGION OF IMMEDIATE CAUSE OF DEATH AS RELATED TO
REGION OF PRINCIPAL WOUND (1)

CAUSE OF DEATH	Abdom- inal	Cer- vical	Extremity	Intra- cranial	Maxillo- facial
PRINCIPAL WOUND					
Intracranial	2	0	3	221	0
Intravertebral	0	0	0	0	0
Maxillofacial	0	0	0	0	0
Cervical	1	2	0	4	0
Intrathoracic	3	0	1	3	0
Thoraco-abdominal	25	0	0	1	1
Combined intra-abdominal & intrathoracic	14	0	0	1	0
Intra-abdominal	89	0	7	0	0
Abdominal wall only	1	0	0	0	0
Upper ext. soft tissue only	1	0	0	0	0
Upper ext. bone & soft tissue	0	0	1	0	0
Lower ext. soft tissue only	5	0	8	0	0
Lower ext. bone & soft tissue	8	0	22	1	0
Unclassified, multiple	5	0	3	3	0
TOTAL	154	2	45	234	1

Continued on next page

TABLE LVI Cont'd

REGION OF IMMEDIATE CAUSE OF DEATH AS RELATED TO
REGION OF PRINCIPAL WOUND (2)

CAUSE OF DEATH	Spinal	Thoracic	General*	Shock	Undetermined, unclassified
PRINCIPAL WOUND					
Intracranial	1	15	0	15	40
Intravertebral	16	4	0	4	3
Maxillofacial	0	3	0	1	4
Cervical	0	4	0	11	3
Intrathoracic	0	37	1	70	23
Thoraco-abdominal	0	20	1	118	46
Combined intra-abdominal & intrathoracic	0	7	1	25	11
Intra-abdominal	0	39	4	178	91
Abdominal wall only	0	1	0	0	1
Upper ext. soft tissue only	0	0	0	2	1
Upper ext. bone & soft tissue	0	0	1	3	5
Lower ext. soft tissue only	1	3	1	9	4
Lower ext. bone & soft tissue	0	15	2	41	25
Unclassified, multiple	1	10	0	46	46
TOTAL	19	158	11	523	303

*Involving more than one region: a miscellaneous group, excluding shock.

TABLE LVII

REGION OF PRIMARY TRAUMA LEADING TO DEATH
NUMBER OF CASES BY PERIOD

	JAN-MAR 1944	APR-JUL 1944	AUG-DEC 1944	JAN-MAY 1945	TOTAL
<u>Primary Trauma</u>					
Abdominopelvic	124	131	80	33	368
Intracranial	97	81	57	46	281
Thoraco-abdominal	62	74	43	23	202
Extremity	83	58	28	9	178
Unclassified, multiple	83	55	25	12	175
Thoracic	44	49	30	11	134
Combined thoracic & abdominal	18	17	10	8	53
Cervical	8	10	2	6	26
Spinal	7	4	8	6	25
Maxillofacial	1	3	1	1	6
Undetermined *	2	0	0	0	2
TOTAL	529	482	284	155	1450

*Record inadequate in description of wounds.

TABLE LVIII

REGION OF PRIMARY TRAUMA LEADING TO DEATH
PERCENTAGE DISTRIBUTION BY PERIOD

	JAN-MAR 1944	APR-JUL 1944	AUG-DEC 1944	JAN-MAY 1945	TOTAL
<hr/>					
<u>Primary Trauma</u>					
Abdominopelvic	23.5%	27.2%	28.2%	21.3%	25.4%
Intracranial	18.3	16.8	20.1	29.7	19.4
Thoraco-abdominal	11.7	15.3	15.1	14.8	13.9
Extremity	15.7	12.0	9.9	5.8	12.3
Unclassified, multiple	15.7	11.4	8.8	7.7	12.1
Thoracic	8.3	10.2	10.5	7.1	9.2
Combined thoracic & abdominal	3.4	3.6	3.5	5.2	3.7
Cervical	1.5	2.1	.7	3.9	1.8
Spinal	1.3	.8	2.8	3.9	1.7
Maxillofacial	.2	.6	.4	.6	.4
Undetermined	.4	.0	.0	.0	.1
	<hr/>				
TOTAL	100%	100%	100%	100%	100%

TABLE LIX

PRIMARY TRAUMA LEADING TO DEATH AS RELATED TO PRINCIPAL WOUND

REGION	Principal Wound, No. of Cases	Primary Trauma, No. of Cases
Abdominopelvic	411	368
Combined intra-abdominal & intra-thoracic	59	53
Thoraco-abdominal	212	202
Thoracic	138	134
Cervical	25	26
Extremity	159	178
Intracranial	297	281
Maxillofacial	8	6
Intravertebral	27	25
Unclassified, multiple	114	177
TOTAL:	1450	1450

TABLE LX

REGION OF PRIMARY TRAUMA LEADING TO DEATH AS RELATED TO
REGION OF PRINCIPAL WOUND (1)

PRIMARY TRAUMA	Abdomino- pelvic	Cer- vical	Combined thoracic & abdo- minal	Extrem- ity	Intra- cranial	Maxillo- facial
PRINCIPAL WOUND						
Intracranial	1	0	0	4	276	0
Intravertebral	0	0	0	0	0	0
Maxillofacial	0	0	0	0	0	6
Cervical	0	24	0	0	0	0
Intrathoracic	0	1	0	2	0	0
Thoraco-abdominal	2	0	0	0	0	0
Combined intra-abdominal & intrathoracic	0	0	51	0	1	0
Intra-abdominal	363	0	0	10	0	0
Abdominal wall only	1	0	0	0	0	0
Upper ext. soft tissue only	0	0	0	4	0	0
Upper ext. bone & soft tissue	0	0	0	9	0	0
Lower ext. soft tissue only	0	0	0	30	0	0
Lower ext. bone & soft tissue	0	0	2	110	0	0
Unclassified, multiple	1	1	0	9	4	0
TOTAL	368	26	53	178	281	6

Continued on next page

TABLE LX Cont'd

REGION OF PRIMARY TRAUMA LEADING TO DEATH AS RELATED TO
REGION OF PRINCIPAL WOUND (2)

PRIMARY TRAUMA	Spinal	Thoracic	Thoraco- abdominal	Undetermined, multiple	Undetermined, no information
PRINCIPAL WOUND					
Intracranial	0	0	0	16	0
Intravertebral	25	0	0	2	0
Maxillofacial	0	0	0	2	0
Cervical	0	0	0	1	0
Intrathoracic	0	123	1	11	0
Thoraco-abdominal	0	2	200	8	0
Combined intra-abdominal & intrathoracic	0	0	0	7	0
Intra-abdominal	0	1	1	33	0
Abdominal wall only	0	0	0	2	0
Upper ext. soft tissue only	0	0	0	0	0
Upper ext. bone & soft tissue	0	0	0	1	0
Lower ext. soft tissue only	0	0	0	1	0
Lower ext. bone & soft tissue	0	0	0	2	0
Unclassified, multiple	0	8	0	89	2
TOTAL	25	134	202	175	2

1900

1. *Phragmites australis* (Cav.) Trin. ex Steud.

100

Phyllanthus

[Faint handwritten notes or bleed-through from the reverse side of the page.]

1. The first group of people who are interested in the study of the history of the United States are the people who are interested in the history of the United States.

REMARKS

The Tables which follow deal with the total reported incidence of immediate and contributing causes of death. In this report, they are the best source of information regarding the incidence of any one condition. All of the figures in the left hand column under "Immediate Cause of Death" represent evident or confirmed incidence. The figures in the middle column represent both evident and suspected evidence but in every instance they are separated and properly identified by the index column. The same applies to the total figures in the right hand column.

We believe the figures are lower than the actual incidence inasmuch as they represent only the reported incidence, knowing that at times the records are not complete. The incidence figures on shock are perhaps nearer the actual than most of the other figures, because many indications of the presence of shock may be found in the record when it is present.

TABLE LXI

TOTAL REPORTED* INCIDENCE OF SHOCK IN 1450
BATTLE CASUALTY DEATHS (1)

	Immediate Cause of Death	Contributory or Associated Condition	Total Reported* Incidence
SHOCK			
Cardiorespiratory embarrasment plus trauma & hemorrhage	147	135	282
SHOCK			
Cardioresp. embarrasment plus trauma & hemorrhage plus contamination or sepsis	72	58	130
SHOCK			
Contamination or sepsis plus trauma & hemorrhage	120	186	306
SHOCK			
Trauma & hemorrhage	182	370	552
SHOCK			
Type undetermined	2	1	3
TOTAL	523	750	1273

*Probably somewhat lower than the actual incidence.

Continued next page.

TABLE LXI Cont'd

TOTAL REPORTED* INCIDENCE OF SHOCK
IN 1450 U.S. BATTLE CASUALTY DEATHS (2)

	Immediate Cause of Death	Contributory or Associated Condition	Total Reported* Incidence
SHOCK			
Corrected by therapy	0	339	339
SHOCK			
Suspected, not proven	0	76	76
SHOCK			
Successful correction doubtful	0	207	207
SHOCK			
Uncorrected	523	128	651
TOTAL	523	750	1273
Shock death suspected	0	128	128

*Probably somewhat lower than the actual incidence.

TABLE LXII

TOTAL REPORTED* INCIDENCE OF INTRACRANIAL CONDITIONS
IN 1450 U. S. BATTLE CASUALTY DEATHS

	Immediate Cause of Death	Contributory or Associated Condition	Total Reported * Incidence
Abscess	1	10	11
Blast trauma, evident	7	17	24
Blast trauma, suspected	0	29	29
Cerebral death suspected	0	57	57
Encephalomalacia	0	60	60
Fungus, cerebral, septic	0	2	2
Hygroma	0	4	4
Ischemia	8	14	22
Meningitis	2	7	9
Trauma and/or hemorrhage, evident, unclassified †	213	155	368
Intracranial trauma, † unclassified, suspected	0	16	16
Other intracranial condition	1	0	1
Undetermined intracranial condition	1	0	1

*Probably somewhat lower than the actual incidence.

†As distinguished from blast trauma.

TABLE LXIII

TOTAL REPORTED* INCIDENCE OF MAXILLOFACIAL CONDITIONS
IN 1450 BATTLE CASUALTY DEATHS

	Immediate Cause of Death	Contributory or Associated Condition	Total Reported* Incidence
Maxillofacial trauma	0	182	182
Maxillofacial hemorrhage	0	9	9
Respiratory obstruction due to plugging of airway	1	2	3
Respiratory obstruction due to edema or hemorrhage	0	2	2
Maxillofacial sepsis	0	4	4

*Probably somewhat lower than the actual incidence.

TABLE LXIV

TOTAL REPORTED * INCIDENCE OF CERVICAL CONDITIONS
IN 1450 BATTLE CASUALTY DEATHS

	Immediate Cause of Death	Contributory or Associated Condition	Total Reported* Incidence
Cervical trauma	0	108	108
Cervical hemorrhage	0	27	27
Laceration, fatal, carotid, or subclavian artery	0	4**	4
Respiratory obstruction due to edema or hematoma	2	10	12
Respiratory obstruction due to plugging of airway	0	9	9
Cervical sepsis	0	3	3

*Probably somewhat lower than the actual incidence.

**Immediate cause of death, listed as shock.

TABLE LXV

TOTAL REPORTED* INCIDENCE OF INTRAVERTEBRAL CONDITIONS
IN 1450 BATTLE CASUALTY DEATHS

	Immediate Cause of Death	Contributory or Associated Condition	Total Reported* Incidence
Intravertebral trauma	16	88	104
Hematomyelia	0	19	19
Hemorrhage	0	13	13
Meningitis	1	1	2
Transection of cord, complete	0	24**	24
Transection of cord, partial	0	11**	11

*Probably somewhat lower than the actual incidence.

**Includes cases from those in whom the immediate cause of death was intravertebral trauma.

TABLE LXVI

TOTAL REPORTED* INCIDENCE OF EXTREMITY CONDITIONS
IN 1450 BATTLE CASUALTY DEATHS

	Immediate Cause of Death	Contributory or Associated Condition	Total Reported* Incidence
Extremity trauma, unclassified	0	669	669
Clostridial myositis of ex- tremity, evident	44*	8**	52
Clostridial myositis of ex- tremity, suspected	0	28**	28
Crushing trauma	0	3	3
Extremity hemorrhage	0	142	142
Extremity sepsis (not clostridial)	0	53	53
Extremity sepsis, unclassified	1	0	1
Frostbite or immersion syndrome	0	8	8

* Probably somewhat lower than the actual incidence.

** Also included in table on Clostridial Infections.

TABLE LVIII

TOTAL REPORTED* INCIDENCE OF THORACIC CONDITIONS
IN 1450 BATTLE CASUALTY DEATHS (1)

	Immediate Cause of Death	Contributory or Associated Condition	Total Reported* Incidence
Thoracic trauma, unclassified	0	176	176
Thoraco-abdominal trauma	1	14	15
Combined intra-abdominal & intrathoracic trauma	0	4	4
Atelectasis, severe	0	33	33
Atelectasis, slight or moderate	0	71	71
Blast trauma, evident	5	84	89
Blast trauma, suspected	0	77	77
Bronchial fistula, evident	0	21	21
Bronchial fistula, suspected	0	5	5
Cardiac trauma, evident	2**	31	33
Cardiac trauma, suspected	0	29	29
Continuing intrapleural hemorrhage	0	8	8
Coronary occlusion	3	0	3
Crushing trauma, evident	0	5	5
Crushing trauma, suspected	0	1	1
Dilatation of heart, severe	0	28	28
Dilatation of heart, slight or moderate	0	61	61

*Probably somewhat lower than the actual incidence.

**Also included with coronary occlusions.

TABLE LVIII Cont'd

TOTAL REPORTED* INCIDENCE OF THORACIC CONDITIONS
IN 1450 BATTLE CASUALTY DEATHS (2)

	Immediate Cause of Death	Contributory or Associated Condition	Total Reported* Incidence
Emphysema, mild or moderate	0	17	17
Emphysema, severe	7	6	13
Emphysema, suspected	0	12	12
External hemorrhage from chest wall	0	2	2
Fat embolism pulmonary, evident	27**	20	49
Fat embolism pulmonary, suspected	0	65	65
Hemoconeumothorax, evident	0	347	347
Hemoconeumothorax, suspected	0	61	61
Hydrothorax, severe	0	9	9
Hydrothorax, slight or moderate	0	77	77
Infarction of lung	3**	6**	9
Intrapulmonary hemorrhage, mild or moderate	0	192	192
Intrapulmonary hemorrhage, severe	0	68	68
Intrapulmonary hemorrhage, suspected	0	36	36
Lung abscess	0	14	14
Mediastinal edema	0	5	5
Mediastinal emphysema	0	16	16

*Probably somewhat lower than the actual incidence.

**Also included in table on Embolism, Thrombosis, and Infarction.

TABLE LXVII Cont'd

TOTAL REPORTED* INCIDENCE OF THORACIC CONDITIONS
IN 1450 BATTLE CASUALTY DEATHS (3)

	Immediate Cause of Death	Contributory or Associated Condition	Total Reported* Incidence
Mediastinal hemorrhage	1	29	30
Mediastinitis	1	4	5
Myocardial decompensation,** evident	4	112	116
Myocardial decompensation, suspected	0	211	211
Other thoracic conditions	0	14	14
Pleural contamination from abdomen, evident	0	22	22
Pneumonia, mild or moderate	0	100	100
Pneumonia, severe	49	22	71
Pneumonia, suspected	0	28	28
Pneumonitis	1	14	15
Pneumothorax without hemothorax	0	5	5
Pulmonary edema, severe	0	204	204
Pulmonary edema, slight or moderate	0	145	145
Purulent bronchitis	0	35	35
Subpleural emphysema	0	5	5
Tension pneumothorax, evident	0	18	18

*Probably somewhat lower than the actual incidence

**Does not include the 3 cases of coronary occlusion

TABLE LXVII Cont'd

TOTAL REPORTED INCIDENCE OF THORACIC CONDITIONS
IN 1450 BATTLE CASUALTY DEATHS (4)

	Immediate Cause of Death	Contributory or Associated Condition	Total Reported* Incidence
Tension pneumothorax, suspected	0	7	7
Thrombotic embolism pulmonary, evident	20**	14**	34
Thrombotic embolism, pulmonary, suspected	0	17**	17
Tracheo-bronchial obstruction, aspirated vomitus	11	21	32
Tracheo-bronchial obstruction, blood and mucus	11	103	114
Tracheo-bronchial obstruction, suspected	0	25	25
Unrepaired wound of diaphragm	0	26	26
Ventricular arrest	2	0	2
Undetermined thoracic condition	12	0	12

* Probably somewhat lower than the actual incidence

** Also included in table on embolism, thrombosis, and infarction.

TABLE LXVIII

TOTAL REPORTED* INCIDENCE OF ABDOMINAL CONDITIONS
IN 1450 BATTLE CASUALTY DEATHS (1)

	Immediate Cause of Death	Contributory or Associated Condition	Total Reported* Incidence
Abdominopelvic trauma	0	147	147
Combined intra-abdominal & intrathoracic trauma	0	4	4
Thoraco-abdominal trauma	0	14	14
Abscess, extraperitoneal	0	12	12
Abscess, intraperitoneal	2	15	17
Adrenal hemorrhage	0	15	15
Adrenal trauma	0	8	8
Adynamic ileus, mild or moderate	0	36	36
Adynamic ileus, severe	0	42	42
Adynamic ileus, suspected	0	1	1
Blast trauma, evident	0	26	26
Blast trauma, suspected	0	20	20
Cellulitis etc, mural & extra- peritoneal	4	20	24
Clostridial myositis of trunk (abdominal), evident	7**	4**	11
Clostridial myositis of trunk (abdominal), suspected	0	10**	10

*Probably somewhat lower than the actual incidence.

**Also reported in table on Clostridial Myositis.

TABLE LXVIII Cont'd

TOTAL REPORTED* INCIDENCE OF ABDOMINAL CONDITIONS
IN 1450 BATTLE CASUALTY DEATHS (2)

	Immediate Cause of Death	Contributory or Associated Condition	Total Reported* Incidence
Contamination from hollow viscus	0	467	467
Crushing trauma, evident	0	6	6
Crushing trauma, suspected	0	6	6
Evisceration, postoperative	0	7	7
Evisceration, preoperative	0	78	78
Evisceration, postoperative & preoperative	0	2	2
Gangrene of bowel, advanced	0	9	9
Gangrene of bowel, early	0	13	13
Gastric dilatation	0	38	38
Hemorrhage, primary	0	499	499
Hemorrhage, recurrent or delayed	0	26	26
Hepatic degeneration, toxic	0	75	75
Hepatitis, epidemic, evident	0	7	7
Hepatitis, epidemic, suspected	0	4	4
Hepatitis, septic, secondary to trauma, evident	0	18	18
Hepatitis, septic, secondary to trauma, suspected	0	18	18
Inflammation of G-I tract	0	7	7
Intestinal obstruction (mechanical) mild or moderate	0	8	8

* Probably somewhat lower than the actual incidence.

Continued on next page.

TABLE LXVIII Cont'd

TOTAL REPORTED* INCIDENCE OF ABDOMINAL CONDITIONS
IN 1450 BATTLE CASUALTY DEATHS (3)

	Immediate Cause of Death	Contributory or Associated Condition	Total Reported* Incidence
Intestinal obstruction. (mechanical) severe	2	6	6
Intestinal obstruction, (mechanical) suspected	0	3	3
Leaking suture line	0	8	8
Nephropathy, pigment, evident	68	31	99
Nephropathy, pigment, suspected	0	8	8
Nephropathy, toxic, degenerative	0	26	26
Operative wound infection	0	17	17
Other abdominal condition	2	23	25
Pancreatic hemorrhage	0	6	6
Pancreatic trauma	0	25	25
Peritonitis, mild or mod.	0	92	92
Peritonitis, severe	65	48	113
Peritonitis, suspected	0	63	63
Renal abscess (parenchymal)	0	5	5
Renal trauma, evident	0	127	127
Renal trauma, suspected	0	11	11
Sepsis, abdominal, unclassified	1	0	1
Splenic degeneration, toxic	0	28	28
Splenomegaly	0	31	31
Unrepaired wound of hollow Viscus**	0	33	33

* Probably somewhat lower than the actual incidence.

** Recorded only for patients who had intra-peritoneal surgery.

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TABLE LXVIII Cont'd

TOTAL REPORTED* INCIDENCE OF ABDOMINAL CONDITIONS
IN 1450 BATTLE CASUALTY DEATHS (4)

	Immediate Cause of Death	Contributory or Associated Condition	Total Reported* Incidence
Ureter traumatized or tied, evident	0	12	12
Ureter traumatized or tied, suspected	0	3	3
Urinary tract sepsis	0	11	11
Undetermined abdominal wall condition	1	0	1
Undetermined intra-abdominal condition	4	0	4
Undetermined: contamination and/or hemorrhage suspected	0	86	86

* Probably somewhat lower than the actual incidence.

TABLE LXIX

TOTAL REPORTED* INCIDENCE OF CLOSTRIDIAL MYOSITIS OR
CEREBRITIS IN 1450 BATTLE CASUALTY DEATHS

	Immediate Cause of Death	Contributory or Associated Condition	Total Reported* Incidence
Clostridial myositis of extremity evident	46	8	54
Clostridial myositis of extremity suspected	0	28	28
Clostridial myositis or cerebritis of head, neck, or trunk evident	5	4	9
Clostridial myositis or cerebritis of head, neck, or trunk suspected	<u>0</u>	<u>10</u>	<u>10</u>
TOTAL	51	50	101

*Probably somewhat lower than the actual incidence.

TABLE LXX

TOTAL REPORTED* INCIDENCE OF EMBOLISM,
INFARCTION, AND THROMBOSIS IN 1450
BATTLE CASUALTY DEATHS

	Immediate Cause of Death	Contributory or Associated Condition	Total Reported* Incidence
Embolism, air, evident	2	2	4
Embolism, air, suspected	0	12	12
Embolism, fat, evident	27	22	49
Embolism, fat, suspected	0	65	65
Embolism, thrombotic, evident	20	14	34
Embolism, thrombotic, suspected	0	17	17
Embolism, thrombotic, and in- farction	0	5	5
Infarction alone	3	13	16
Infarction and thrombosis	0	9	9
Thrombosis alone, evident	0	35	35
Thrombosis alone, suspected	0	3	3

* Probably somewhat lower than the actual incidence.

TABLE LXXI

TOTAL REPORTED*INCIDENCE OF MISCELLANEOUS DATA
IN 1450 BATTLE CASUALTY DEATHS

	Immediate Cause of Death	Contributed or Associated	Total Reported* Incidence
Anaphylaxis, suspected	0	2	2
Anemia, refractory or severe	0	13	13
Anesthetic agent, cause of death	7	0	7
Anesthetic agent, suspected	0	25	25
Blast death, suspected	0	29	29
Jaundice	0	24	24
Malnutrition, severe	0	10	10
Morphine poisoning, cause of death	0	0	0
Morphine poisoning, suspected	0	4	4
Other contributory conditions	0	2	2
Septicemia (excluding clostridial)	1	1	2
Transfusion reaction severe	1	6	7
Respiratory failure cause undetermined	1	0	1
Undetermined unclassified	303	0	303

* Probably somewhat lower than the actual incidence.

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